



Delving into Indigenous Histories of the Twentieth Century | Altruism on the Prairies

You Are What You Think | Healing Together | The Climes They Are A-Changin' | Bridging Two Worlds

Three Rights Make a Success | More is Different | Grassroots Leaders and Power | One Shoe Can't Fit All



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The University of Winnipeg

RESEARCH

2011-13



Diane McGifford, Ph.D.
Minister of Advanced
Education and Literacy



Greetings

The Manitoba government is a proud supporter of post-secondary education in our province.

At The University of Winnipeg, students are fortunate to be able to participate in research programs from the undergraduate level onward. This practice presents tremendous opportunities for students to further their education and contribute to the advancement of their fields of study.

Recognizing the value of research, both academically and socially, our government supports many influential research projects in a variety of relevant disciplines, including science, sociology, urban studies, and the environment.

As The University of Winnipeg continues to grow in size and scope, so will your outstanding research portfolio. Our government looks forward to working with you to build on your success. ■



Greeting from Dr. Lloyd Axworthy, Ph.D.
The University of Winnipeg
President and Vice-Chancellor

The University of Winnipeg is a campus undergoing significant transformation – with new facilities, new programs and a new approach to both the student experience and the community around us. Throughout this process, we are enhancing the quality of teaching and making research a top priority for our students and faculty.

The construction of the new Richardson College for the Environment & Science Complex is a principal example of how UWinnipeg's transformation is coming about. Opening in Fall 2011, this state-of-the-art facility will be the most dynamic science and environment education building in Canada, serving as a catalyst for cutting-edge innovation, teaching, research, and development. It will attract world-class experts to the University in a wide range of areas including biomedical sciences, urban ecology, water stewardship, "green" chemistry, and Indigenous science.

The Richardson College for the Environment will also be home to a variety of policy centres and applied research initiatives such as UWinnipeg's renowned Institute of Urban Studies (IUS), the Cisco Chair for Collaborative Technologies and a Cisco TelePresence Suite, and the Prairie Isotopes Partnership Enterprise (PIPE), Inc.

In this regard, the Richardson College for the Environment will be a major player in key research projects including a national study through the Mental Health Commission of Canada on housing and mental health issues. The College will also be a hub for the use of TelePresence videoconferencing

technology for both teaching and commercialization, and one of only a few centres developing solutions to the shortage of medical isotopes in Canada.

In addition, the College will house the newly-renamed Department of Indigenous Studies with its Bachelor's and Master's degrees in Indigenous Governance. The department will provide crucial support to the new Master's in Development Practice (MDP) in Indigenous Development. Beginning in September 2011, UWinnipeg will be one of only 22 universities worldwide to offer this internationally recognized MDP degree program. Thanks to generous support from the MacArthur Foundation, the MDP is a two-year program of study and applied research which will train aspiring development practitioners to understand and manage global sustainable development challenges across health sciences, natural sciences, social sciences, and management disciplines.

UWinnipeg is one of the few places in Canada offering a Bachelor's degree in Human Rights and Global Studies, a Master's degree in Peace and Conflict Studies, and several undergraduate degrees in the emerging field of Disability Studies.

For students who want the challenge of tackling the world's most pressing issues, there has never been a better time to attend The University of Winnipeg. ■

Neil Besner Ph.D. Vice-President, Research and International

The Research Office at The University of Winnipeg serves our faculty and our students in their commitments to a rich array of research projects in our five Faculties. Current research at The University of Winnipeg is vitally related to our mission to engage with several communities. We are a community of scholars and scientists who pursue basic research that inquires into fundamental questions in each of the academic disciplines. At the same time, we work in an institution vitally engaged in applied research that engages with and transforms the local, national, and international communities that we live among. These commitments and goals are neither incompatible nor mutually exclusive, any more than our research activities are unrelated to our teaching. On the contrary: excellent basic and applied research often support and inform each other, just as excellent

teaching and research are often mutually nourishing.

The profiles in this volume highlight the vibrant research community The University of Winnipeg is. Our future as an excellent research and teaching community depends upon, and extends our traditions. That is just as it should be. ■



John Corlett Ph.D. Vice-President (Academic)

"If we knew what it was we were doing, it would not be called **research**, would it?" (*Albert Einstein*). And that is what makes research the exciting lifelong affair that university faculty experience. There is no other job quite like coming to work each day knowing you can be surprised at any time by an unexpected finding that changes your perspective on what you thought was true. An undiscovered quote in a long lost diary. A strange outlier in a data set. A character in a novel who reveals herself in a new way after a tenth reading. As biologist Lewis Thomas noted, you know someone's research is

going well when you walk past the lab door and hear someone say, "That can't be right." And so to all of our faculty, students, and staff who find new and important questions to ask and new pathways to knowledge each and every day, my thanks and my congratulations. Your contributions are central to the very meaning of a university. ■



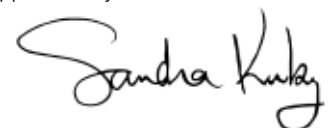
Sandra Kirby, Ph.D. Associate Vice-President (Academic) and Dean of Graduate Studies

I have been at the helm of research at The University of Winnipeg from July 2007 until September 2010 when responsibility was passed on to Dr. Besner. On my watch, we had some remarkable achievements in research. Just look at the expanded research funding brought in by researchers from CFI, NSERC, and SSHRC! Many of those stories are highlighted in the publication.

Success comes in many forms. For example, in the Sciences, the largest CFI in Manitoba was won by Dr. Jeff Martin and his team. We are now eligible for and have earned our first CIHR grants. With the new Richardson College for the Environment & Science complex, the focus on research is intensifying, and a number of innovative research teams are forming to take advantage of the new science laboratories. A single animal care centre replaces researcher-managed labs. In Arts and in Education, new cooperative research



teams are at work in areas as diverse as children's culture, urban development and housing, Indigenous science, human rights, and sport performance motivation. Additionally, the University has proved an able host to the first-ever Trudeau Visiting Fellow, International (Dr. Clare Bradford) and a number of post-docs and visiting research associates. But, for me, the litmus test of our research capacity is the successes of our students. Our undergraduate and graduate students are really 'punching way above their weight' in research productivity. We are extraordinarily proud of them and of each and every faculty member who works with them. My applause to you all! ■



The Richardson College

For the Environment and Science Complex



The University of Winnipeg's new Richardson College for the Environment and Science Complex will provide cutting-edge classrooms, offices and laboratories for the Departments of Biology, Chemistry, and Environmental Studies.

The centerpiece of this new facility is the Richardson College for the Environment. Named in recognition for a generous donation of the Richardson Family, Firm & Foundation, the Richardson College will be a multi-disciplinary centre, engaging students and faculty in innovative teaching and research in natural and social sciences with a focus on the North, climate change, water stewardship and inner city issues. It will also be a centre for action strategies derived from the research and public policy initiatives associated with sustainability. Located on the third floor of the facility, the Richardson College will be home to various University units involved in sustainability research and action. This includes two Canada Research Chairs in Indigenous Science Education and Inner City Issues – Community Learning and Engagement, the Institute of Urban Studies, the new Master's in Development Practice program, the Indigenous Studies program, the CISCO Centre for Collaborative Technologies, the University Sustainability Office, the University's medical isotope initiative, and the UW Community Renewal Corporation. The Dean of Science will serve as Principal of the Richardson College.

The building will also be home to the Digital Learning Laboratory associated with the University's Library and the Collegiate Model School.

The four-storey, 150,000 square foot facility will contain more than 30 research and teaching laboratories, including a vivarium, animal holding and research complex and a herbarium.

The building will be a model for green building technology and will be constructed to a minimum LEED (Leadership in Energy and Environmental Design) Silver Standard with a goal of achieving maximum energy efficiency. The largest energy cost for lab buildings is the energy required to move the large volumes of air required to meet design standards for laboratories. Typically, engineers design to the highest use. The design of this building has recognized different air flow requirements for different uses and developed a three-mode system to significantly reduce the amount of air required. Under this system, standard operating procedures will enable the labs to be operated at one air change per hour when unoccupied, four air exchanges per hour in utility mode and eight air exchanges per hour in full lab mode. In addition to reducing air requirements, the building will also have an industry leading heat recovery wheel. The wheel will enable 80% heat recovery including fume hood exhaust. ■

In Memoriam



Dr. Randy Kobes, Associate Dean of Science and Professor of Physics, passed away on September 18, 2010. Randy taught physics at The University of Winnipeg for 23

years. He moved into the Office of the Dean of Science in 2007, where he had been serving as the Associate Dean of Science until his passing. Randy was a participant and a driving force of many University and community programs, such as Let's Talk Science, Eco-Kids, CSI (Community School Investigators), and the Wii Chiiwaakanak Learning Centre. In June 2005, Randy was awarded the Marsha Hanen Award for Excellence in Creating Community Awareness. In October 1999, he won the Erica and Arnold Rogers Award for Excellence in Research and Scholarship. Randy was an excellent academic, physicist, and educator of young people. He was fully dedicated to public engagement in science. His contributions to education and discovery at The University of Winnipeg went far beyond the classroom.

Randy had three main areas of research interests, including quantum field theory, especially at finite temperature and density, classical non-linear theories that exhibit chaotic and fractal behaviour, and quantum computing and quantum information theory. Randy received his B. Eng. (Physics) from the University of Saskatchewan, M.Sc. (Physics) and Ph.D. (Physics) from the University of Alberta. Randy had been awarded numerous grants in support of his research over the last two decades. Randy was author of over 75 research publications and three books.

A scholarship is being established in Randy's memory. For more information or to donate, please contact Tanya Misseghers, Donor Stewardship Officer at The University of Winnipeg Foundation, at ta.misseghers@uwinnipeg.ca or 204.789.1409.

-Rod Hanley, Dean of Science

Plans for Filling a Medical Shortage

Medical isotopes are used every day in imaging procedures to diagnose diseases of the brain, bone, heart, liver, lungs, kidney, and spleen. In these procedures, a radioactive isotope is attached to a chemical compound and injected into a patient. The chemical is designed to accumulate in the desired, targeted area within the patient's body. Once there, the isotope decays by emitting gamma radiation. One can use an external camera that is sensitive

(NRCan) invited proposals last year by the private and public sectors for alternative methods of producing Mo-99. The call was answered by a group centred at The University of Winnipeg, creating partnerships with Acision Industries (Pinawa), and the University of Manitoba's Department of Radiology at Health Sciences Centre (Winnipeg). The group formed a non-profit organization called the Prairie Isotope Production Enterprise

supply would be stable and secure. This would truly be a new and impressive major research facility for UW and for the province as a whole.

The scientific effort at UW is led by Prof. Jeffery Martin (Physics), and includes Profs. Esmat Elhami (Physics), Chris Wiebe (Chemistry), and Desiree Vanderwel (Chemistry). ■

Isotope shortages were experienced world-wide, leading nuclear medicine procedures to be canceled, with a significant detrimental impact on patient care.

to this radiation to construct detailed images of the targeted area, in a way that is sensitive to function, and less harmful than biopsy or surgery. The most commonly used isotope for this purpose is technetium-99m (Tc-99m). This isotope has a half-life of six hours and decays by emitting gamma rays of about the same energy as a conventional X-ray. The short half-life makes it useful for diagnostic purposes, but also makes it inconvenient for transport over long distances. For this reason, a Tc-99m generator is used. The generator contains molybdenum-99 (Mo-99), which has a half-life of 66 hours and produces Tc-99m when it decays.

Recent closures of the few nuclear reactors that produce these isotopes (most notably Canada's National Research Universal Reactor in Chalk River) led to a global medical isotope crisis. Isotope shortages were experienced world-wide, leading nuclear medicine procedures to be canceled, with a significant detrimental impact on patient care.

Natural Resources Canada

(PIPE, <http://pipe.uwinnipeg.ca>). The project received core funding in December, 2010 from NRCan.

Our proposal calls for the production of Mo-99 using electron accelerators instead of a nuclear reactor. In our process, a natural and stable isotope of molybdenum (Mo-100) is bombarded with electrons, liberating neutrons and thus creating Mo-99. With a high-power but otherwise conventional industrial electron accelerator, enough Mo-99 can be created to satisfy a significant fraction of Canada's daily needs for the product.

The support provided by NRCan is sufficient to secure research funds on the project, and to produce the isotopes at host electron accelerators elsewhere. We hope to expand our efforts and upgrade our existing electron accelerator currently located at Acision Industries. In this way, the isotopes would be produced within the province and their



A container developed by PIPE to transport Mo-99 from production facilities to the radiopharmacy at Health Sciences Centre (Winnipeg).



Dr. Jino Distasio

Helping House Canada's Homeless

Dr. Jino Distasio is an Associate Professor of Geography and Director of the Institute of Urban Studies. He has been with UWinnipeg since 1999.

With \$110 million dollars in funding, the At Home Chez Soi project is considered to be the world's largest research effort to target homelessness and mental health. The project is focused on assessing whether a "Housing First" intervention presents an effective treatment for transitioning people off the streets and into stable housing with specialized supports.

"This project is a massive undertaking that brings service, housing and research together to better understand how to help people get housing and supports," said Dr. Jino Distasio, one of the Principal Investigators for Winnipeg.

The project's mission is to house up to 1300 Canadians in Moncton, Montreal, Toronto, Winnipeg, and Vancouver. Housing First is a unique approach that places an emphasis on rapid housing without any prerequisites followed by individualized supports. It began in New York City in 1992 when Pathways to Housing was launched. The Pathways model has been shown to be less expensive than traditional shelters that do not provide permanent housing and offer little in the way of supports.

In the Canadian demonstration project each of the five cities is delivering services and supports using a standard approach that is then tailored to each centre. In Winnipeg, some 300 persons will be transitioned into housing, with an additional 240 participants

recruited to form a comparison group. Services and supports are being delivered in Winnipeg by a number of organizations that include Aboriginal Health and Wellness, the Mount Carmel Clinic, Ma Mawi Wi Chi Itata Centre, and the Winnipeg Regional Health Authority, with support from a number of provincial departments.

The research team consists of The University of Winnipeg's Institute of Urban Studies and the University of Manitoba's Department of Psychiatry, Community Health Sciences and the Manitoba Centre for Health Policy Research. Jino Distasio notes, "Our research team went from two people with an idea to nearly 30 committed and caring staff. Our interviewer team will conduct close to 5000 interviews over the four-year project."

An important part of the project has been to build capacity and support in the community. Students, community members, and organizations are all working to build capacity to ensure that the work being done today is sustainable in the future. According to Distasio, "We want to continue to endorse a Housing First approach. At the end of each day, we are becoming more aware about not only about the root causes of homelessness but the pathways out of homelessness and they type of programs and supports needed to make this happen. As well, we know that each person helped by the study has a unique story; the strength of a Housing First Approach is that services and supports are based on individual need."

The project has just completed its first year and will run until 2013. To date, the research team has recruited 375 persons into the study. ■

"We become more aware, not only about the root causes of homelessness but about the pathways out of homelessness."

World-wide Video Conferencing Works

Thanks to a major contribution from Cisco Systems Ltd., UWinnipeg is positioned to be a global leader in the use of collaboration technology. The hardware and software provided by Cisco enables researchers to collaborate with peers around the world using advanced telecommunication technology, information sharing software, and secure intellectual property software vaults.

Using a technology known as TelePresence, researchers will be able to reduce travel costs and the associated carbon footprint while increasing the frequency and depth of their interactions with peers. Researchers will be able to share their findings within a select group of collaborators, or to use the tools to interact with a broader community of interest. Video

conferences can be recorded and indexed for rapid retrieval of relevant data. UWinnipeg has already hosted a number of conferences with people in American and Canadian universities. One recent session involved participants in New York, Washington, Havana, Geneva, London, and Winnipeg.

UWinnipeg has successfully connected its Cisco TelePresence suite with similar systems made by Tandberg, Polycom, and Sony. This technology delivers a full high-definition video and audio experience. Body language and facial expressions are every bit as visible as they would be when sitting around the table at an in-person meeting. There are no break ups, no delays, no watching lips move with no sound coming out.

The UWinnipeg TelePresence suite is connected directly to the MRnet, CANARIE, and LambdaRail networks. These connections to other national research and education networks and commercial networks worldwide expand the universe of collaboration points. Currently, UWinnipeg can host up to 12 locations in a single video meeting. Those could be other TelePresence sites, standard resolution video conferencing systems, or even desktop webcams. Later this year, even smart phones and tablet users will be able to participate in a TelePresence meeting.

The Cisco TelePresence Collaboration Suite is available to the entire UWinnipeg academic community. ■



Researchers will be able to share their findings within a select group of collaborators, or to use the tools to interact with a broader community of interest.



Bats at Risk; the Clock is Ticking

Dr. Craig Willis is an Associate Professor in Biology studying the ecology, behaviour, and physiology of wild mammals. He and his students conduct research about mammalian ecology and evolution, as well as applied conservation research that is important for understanding the impacts of climate change, industrial development, and habitat loss on wildlife. Recently the Willis lab has been part of the major international effort to understand a disease called White Nose Syndrome (WNS).

WNS was discovered in 2006; it has spread rapidly throughout eastern North America and recently into Ontario and Quebec. The disease is named for a white fungus (called *Geomyces destructans*) which grows on the exposed skin of the muzzles and wings of the bats. Little brown bats, one of the most common North American species, are the hardest hit. Current estimates predict local extinction for this species within 20 years of the arrival of WNS in an area.

This is a crisis for bat conservation but also has wider consequences for ecosystems, forestry, and agriculture, given the role of bats as the primary consumers of night-flying insects. Recent estimates suggest that bats are worth billions of dollars annually for North American agriculture because of reduced crop damage and pesticide costs.

Dr. Willis and his collaborators have recently received nearly US \$400,000 over two years from the U.S. Fish and Wildlife Service. These funds will support field and laboratory studies to better understand precisely how *Geomyces destructans* is killing bats and to determine the potential for natural selection to help bat populations rebound from WNS in the future. Also involved in the research are Dr. Jens Franck from Biology at the UWinnipeg, two post-doctoral fellows in Dr. Willis' group, Dr. Lisa Warnecke and Dr. James Turner, and international collaborators from Europe and the U.S. ■



Dr. Craig Willis (L)



Samantha Arnold, bottom row (right)

Branding A Nation

Dr. Samantha Arnold's research adopts a critical theory perspective on Canadian foreign policy, and explores the intersection of Canadian foreign policy theory and practice with the politics of 'nation branding.' Expanding upon previous work on Canadian public diplomacy in this context, her current research explores these issues with respect to Circumpolar politics in general, and the Arctic dimension of Canada's security and foreign policy in particular. This exploration of the 'northern dimension' of Canadian policy highlights the production of Canada's identity as an 'Arctic nation,' and considers the implications of this identity politics for Canada's role in emerging circumpolar governance structures - most notably, the Arctic Council - and also for relations with indigenous peoples' organizations nationally and internationally. She is particularly interested in the ways in which the Canadian foreign policy agenda has drawn on Inuit internationalism to advance an important - albeit contradictory - element of Canada's identity claims. An important manifestation of this tension is seen in the way in which historical Inuit occupation is a key justification for Canada's sovereignty claims over the Northwest Passage, at the same time as the Nunavut Land Claims Agreement remains incompletely implemented. On the question of sovereignty and the Northwest Passage, Samantha is a member of a multidisciplinary team exploring the wide-ranging impacts of climate change and commercial shipping in the Arctic. Headed by Frédéric Lasserre (Université Laval), this research is supported by SSHRC, FQRSC, and most recently by an ArcticNet grant.

The Canadian Spallation Ultracold Neutron Source

A puzzle about our universe has perplexed physicists for some eighty years now: where is all the antimatter? We think that in the Big Bang, as the universe rapidly expanded, equal parts of matter and antimatter must have been produced. So where has all the antimatter gone? Amazingly, a possible answer lies in precise studies of neutrons: if the neutron is found to possess an electric dipole moment (EDM), then a new source of a difference between matter and its counterpart, antimatter, must also exist. Such a discovery would be revolutionary to our understanding of the connection between particle physics and our universe.

Prof. Jeffery Martin (Physics) is the leader of a joint Canada-Japan effort to make the most precise measurement of the neutron EDM ever conducted. The project centres on the creation of the world's highest density source of ultracold neutrons (UCN), which will be constructed in Canada. The project is a \$11M effort, and was funded through contributions from the Canada Foundation for Innovation, the Japan Society for the Promotion of Science, the Government of Manitoba, Acision Industries (Pinawa), and national laboratories in Canada and Japan (TRIUMF, KEK, and RCNP Osaka). ■



Jeffery Martin

One Shoe Can't Fit All



Professor: **Dr. Harinder Aujla**
Title: Assistant Professor
Department: Psychology

Two plagues common to many societies are chronic stress and drug abuse. With the goal to improve medical treatment, Dr. Aujla studies the effects in the brain and in behavior produced by drug abuse. His research extends as well into a comparative study on the brain and behavioral changes produced by chronic stress.

As people increase their harmful drug intake, they transition from impulsive to compulsive behavior. That is, their motivation is less the reward but rather the reduction of aversive withdrawal symptoms. In addicts, this motivational

drug-seeking behavior. These subjects prefer locations where drug access has been previously available. Moreover, subjects with a chronic stress history acquire this propensity more quickly than normal subjects.

The transition to compulsive behavior also impacts the brain. Increasing the quantity and frequency of harmful drug consumption results in persistent and permanent brain changes. These changes cause the subject to over-react to stress and activate the reward system need for drug relief. Dr. Aujla's research has shown that a history of chronic stress will produce the same persistent

treatment. If the dysregulated brain responds differently to pharmaceutical treatment, then there may be an unanticipated and perhaps dangerous response. These principles apply across every drug class, making dosage an important factor when treating conditions such as anxiety and depression. It also implies that once an addict is physically detoxified, he will remain vulnerable to relapse.

Dr Aujla is extending his work to identifying the regions of the brain manifesting the dysregulations caused by drug abuse and chronic stress and comparing the two types of changes.

THESE PRINCIPLES APPLY ACROSS EVERY DRUG CLASS, MAKING DOSAGE AN IMPORTANT FACTOR WHEN TREATING CONDITIONS SUCH AS ANXIETY AND DEPRESSION.

change manifests itself in an intensified drug-seeking behavior. Dr. Aujla is investigating whether a history of chronic stress produces similar changes. To simulate how chronic stress develops in humans, he uses an animal model and creates an irritating situation that becomes more bothersome over time. Preliminary results indicate that chronic stress does increase the propensity for

dysregulation of the brain stress systems and hence a similar exacerbation.

Dr. Aujla has also seen evidence that abstinence does not reverse these brain changes. Rather, abstinence masks the dysregulation. Renewed exposure to stress will produce an exaggerated drug seeking reaction. This warrants caution in any pharmaceutical stress-reducing

Combining the knowledge about the changes in the brain with a patient's history will help provide more effective medical treatment on a case-by-case basis. ■



Professor: **Dr. Mary Jane Logan McCallum**
 Title: Assistant Professor
 Department: History

Delving into Indigenous Histories of the Twentieth Century

Scholars of Aboriginal history commonly build research questions on the tacit premise of Aboriginal decline. Dr. McCallum is convinced there is more to the story. In 2010, the Centre for Aboriginal Health Research agreed, awarding her the “*New Investigator Award*” for her research into Indigenous women’s history.

Dr. McCallum’s work adds to a growing literature investigating Aboriginal people in the modern era and challenging the assumptions about Aboriginal retreat, insignificance and loss that inundate narratives about Aboriginal modernity. Her interests lie primarily in the fields of health, education, and employment. She reviewed the period from the

Welfare, currently Health Canada, framed women’s roles. Accessing nursing education entailed a number of bureaucratic hurdles for Status First Nations women. The Departments of Indian Affairs and National Health and Welfare held significant control over access to secondary and post-secondary education and to employment. Applications involved the approval and endorsement of various department officials and, while it was the Departments’ stated objective to support education, in reality, students were often encouraged to enter domestic service.

Aboriginal women were primarily motivated to improve Aboriginal community health. The Aboriginal Nurses Association’s main goals were

accident prevention, domestic violence, and traditional medicine. The health profession is indebted to these women for their groundbreaking work.

Dr. McCallum is interested in the First Nations history of tuberculosis in Manitoba. Part of a larger body of work undertaken by the Treaty Relations Commission of Manitoba, Dr. McCallum will study the logics and procedures for medical diagnosis, removal, and hospitalization. In addition, she will study the nature of race-, gender-, and social class-specific education and rehabilitation programs at Manitoba sanatoria.

Dr. McCallum is also collaborating with a New Zealand colleague on a trans-Indigenous research project. This project investigates Indigenous women’s interventions into federal policies affecting the health of Maori and First Nations communities by examining the activities of two mid-century Indigenous women’s organizations. Acknowledging these and other histories of Aboriginal women profoundly reshapes the substance, questions, and frameworks of Indigenous and Canadian history. ■

Acknowledging histories of Aboriginal women profoundly reshapes the substance, questions and frameworks of Indigenous and Canadian history.

1940s through to the 70s when many Aboriginal women entered the health field as nurses, hospital staffers, and Community Health Representatives. Dr. McCallum examined how this came about, how Aboriginal women perceived Aboriginal health, and how the Department of National Health and

altruistic in nature: to improve the health of Aboriginal communities and to recruit, retain, and represent Aboriginal people in the nursing profession. The Association and its members brought to the profession crucial studies and discussions of issues affecting their communities including

A Matter of Extreme Gravity

At the moment, Dr. Kunstatter's research concentrates on two specific areas: the quantum mechanical properties of black holes and quantum computation. One of the most important problems in theoretical physics today concerns the microscopic source of black hole entropy. Briefly stated, Dr. Kunstatter is in search of the interaction between gravity and quantum mechanics.

Gravitational theory and quantum mechanics are very well tested individually. Scientists predict they must interact at some point. Therein lies the crux of the problem. Previous attempts to bring the two theories together into a unified framework have led to infinities, that is to say, nonsense. Unfortunately, the astronomical amount of energy required to witness this interaction is out of the question, therefore, physicists are in need of a theoretical breakthrough.

Constructing a theory that unifies quantum mechanics and gravity is extremely difficult. Dr. Kunstatter has chosen black holes as a theoretical tool. They are the simplest objects in the universe—mostly empty space, eternal, perfectly round. But with all matter located at their very centre, they provide a clear sign of the breakdown of relativity.

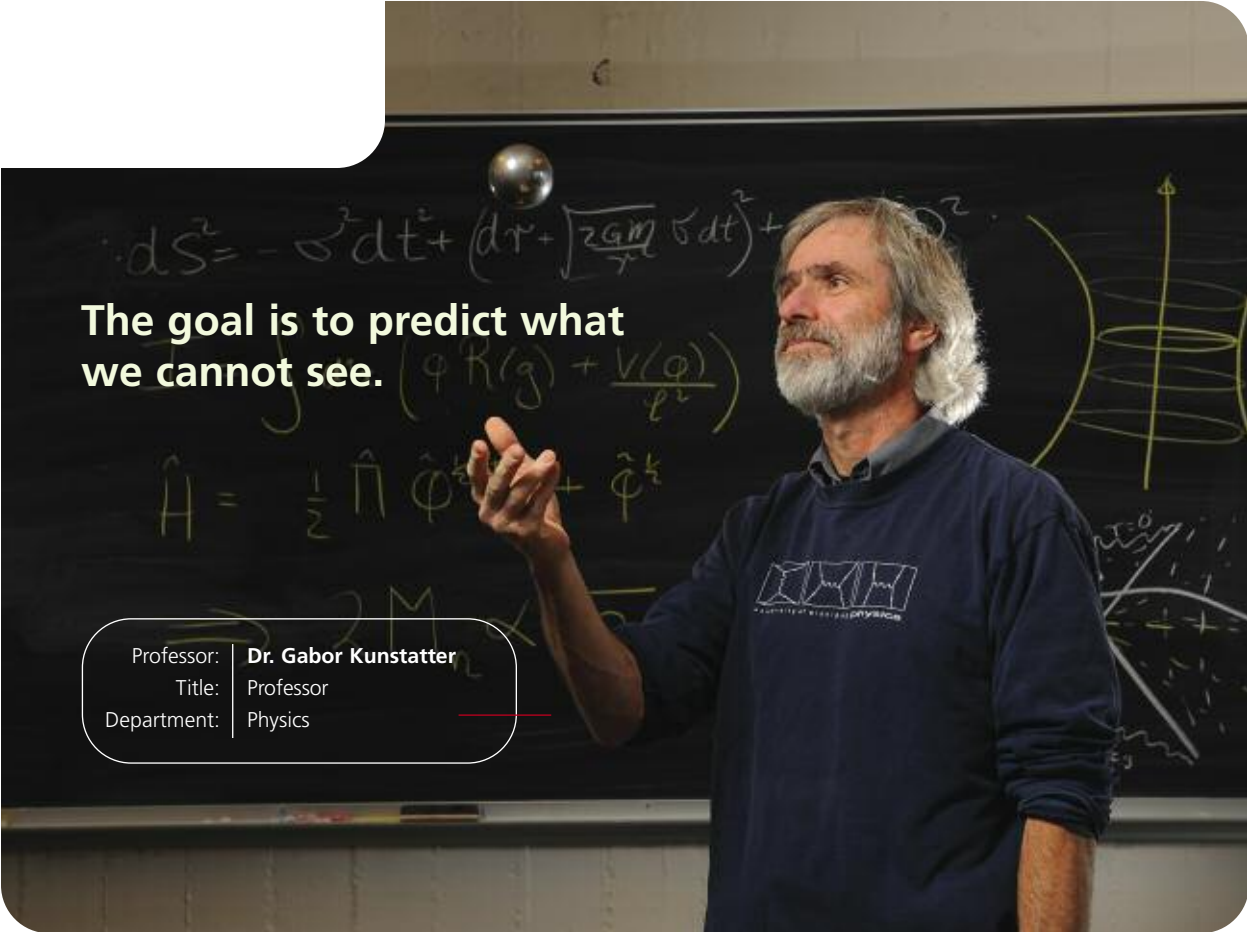
Dr. Kunstatter constructs simple mathematical models that possess the relevant properties of physical black holes. Based upon mathematical theorems, he safely assumes the black holes are smooth and perfectly round. This facilitates calculations.

However, reducing everything to its simplest form is not so simple. When quantum mechanics is applied to the space-time around a black hole, the black hole acquires thermodynamic properties and enormous entropy. Complexity reigns. By virtue of these contradictions, black holes provide

clues about the next paradigm shift.

The fundamental goal of physics is to understand how nature works. Nature is governed by systematic rules, which, once understood, fit into a beautiful mathematical structure making predictions possible about what we have yet to see. A paradigm shift emerges to view the universe under a new light.

Already new knowledge has come into being. For example, the vibrational or "ringing" modes of space-time around black holes have been calculated and their relation to quantum black holes revealed. More importantly, it has been shown that quantum mechanics can indeed eliminate the region of infinite density at the centre of a black hole, with surprising results. In at least one scenario, the interior of a quantum black hole contains an entire universe, infinite and forever hidden from our view. ■



The goal is to predict what we cannot see.

Professor: **Dr. Gabor Kunstatter**
Title: Professor
Department: Physics



Professor:	Dr. Jennifer Clary-Lemon
Title:	Assistant Professor
Department:	Rhetoric, Writing, and Communications

Despite this historical development, Canadian scholars often find it necessary to further their studies in rhetoric and writing elsewhere. To address this situation, Dr. Clary-Lemon is helping to develop a Master's stream valid in its own right for professional and public lives. The complement of a Canadian Master's program in rhetoric and writing studies, the first in the nation, would help bridge the gap between emerging undergraduate degrees in writing studies and their more common PhD counterparts, which may ground a rich new area of scholarly inquiry in Canada.

Seconded to the Centre for Teaching, Learning, and Technology, Dr. Clary-Lemon has furthered her interest in national identities and scholarship by examining the best practices of Educational Development Centres across Canada. The goal is to streamline university teaching through improved execution by providing cost-effective recommendations to obtain pertinent resources, increase efficiency, and avoid overlap. Dr. Clary-Lemon passionately believes teaching is an art and plans to debunk the myth that possession of knowledge at the PhD level is sufficient to transmit content. The implementation of well-researched

Identity and Language

As they have in the past, waves of divergent immigrant populations will continue to make a significant contribution to Canadian society. How do they adapt? Scholarship intending to support adaptation historically has stemmed from studies conducted by gathering data from native-born Canadians writing and speaking about immigrants. Dr. Clary-Lemon's goal is to add immigrants' voices to the process. Her research into the discursive construction of immigrant identity examines immigrant populations' use of language to describe themselves and their relationships to those around them. She states, "It is not our identity that forges our language but rather our language that forges our identity." For Irish immigrants to Canada, the focus of Clary-Lemon's research, words like "we" reflect a range of meanings—'we Ireland-born Irish,' 'we Irish-born immigrants,' or a 'we' that signifies transition to 'we Irish-Canadians.'

Other notions such as "home" and "away" are equally nuanced, reflecting immigrant identity within the Canadian context. Considering the concept that identities are given significance through language will help formulate a changing concept of "the immigrant as other," and help influence public policies that are in tune with further welcoming immigrant diasporas.

"It is not our identity that forges our language but rather our language that forges our identity."

In tandem with her research on nation, Dr. Clary-Lemon rejects the idea that Canadian writing echoes the American context. Her examination of 70 years of Canadian scholarly publications in writing studies provides definite evidence there exists a national critical mass of scholarship on writing that manifests a distinct set of challenges, exigencies, and contexts.

pedagogy accessible to all professors will further strengthen one of the pillars of a dynamic university - that of excellent teaching. ■

Politics, Justice, Enforcement

Dr. Jochelson's research in the area of legal scholarship focuses on examining the Supreme Court's role in making law and legal definitions on nation-wide issues. What mechanisms are used? Are they applied consistently? Is the Supreme Court the ideal arbitrator in such matters? Some of the issues he examines are indecency, pornography and prostitution – all activities associated with the notion of 'harm.' A conundrum comes to light in cases where the infliction of harm is intangible or incapable of traditional means of proof.

Take for example the 2005 case to determine if swing club conduct is indecent. Indecency is defined as harmful to society. At the time, there was no definition in Canada of what is harmful. The Supreme Courts created a "legal fiction" comprised of a three-part harm test. Canada purports to regulate morality nationally, but it is left to the Supreme Court to fill the legal void on a case-by-case basis. In

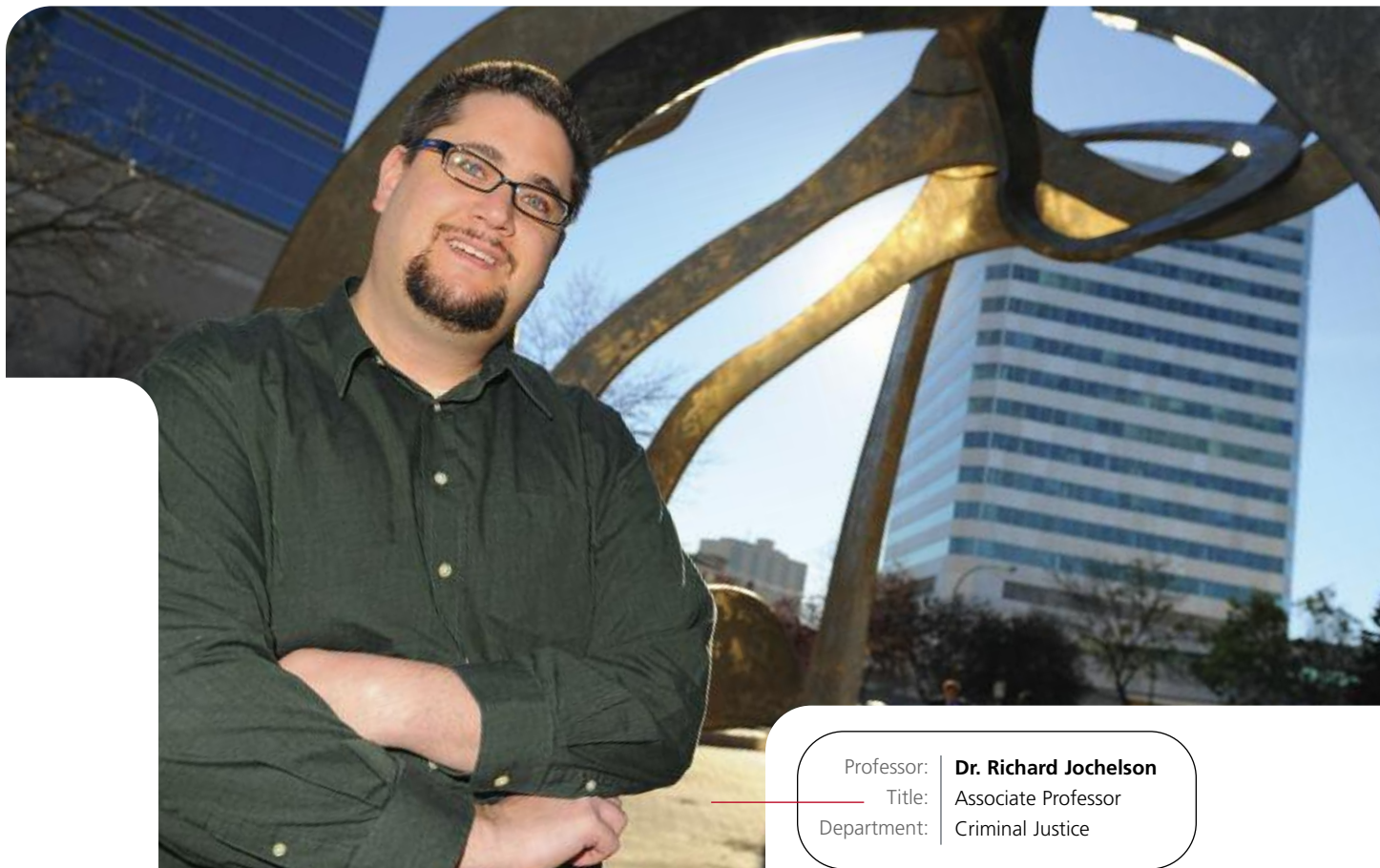
essence, appointed judges, with no electorate to answer to, are creating a moral set of parameters for the nation on a case-by-case basis.

The question of national morality comes again to the forefront with the Ontario court's recent decision that prostitution laws are not constitutional. Depending upon how, in particular, the "bawdy house" prohibitions (which encapsulate indecency and prostitution), are interpreted, the end result could be a legalized but unregulated sex trade in Ontario with a criminalized one in the rest of Canada. On a national level, this leads to piecemeal enforcement.

The Supreme Court's creation of police powers on an ad hoc basis has also captured Dr. Jochelson's attention. Specifically since 9/11, there has been increasing latitude in the Court's bestowing of search powers. Similar to the notions of national morality, the pendulum swung towards an ad hoc approach. One such development was

the Court's proliferation and strengthening of a legal test for search and seizure, called Ancillary Powers. It allows for what appear to be previously unlawful searches. The Court's justification is based on creating the illusion that a previously invisible but legal truth in the ether of the common law exists and that it should now be given legal effect.

Dr. Jochelson states the Supreme Court is limited by the particular circumstances of each case when constructing legal definitions or laws on questions of national interest. This opens the door to a torrent of interpretations and has ramifications on civil liberties and privacy protection. His recommendation is to seat such issues of national concern with Parliament. Courts should be wary to replace political policy with its interpretation of morality. ■



Professor:	Dr. Richard Jochelson
Title:	Associate Professor
Department:	Criminal Justice



Professor: **Dr. Melanie Gregg**
Title: Assistant Professor
Department: Kinesiology and Applied Health

You Are What You Think

A former high level competitive athlete herself, Dr. Gregg has direct experience with the contribution of imagery to performance enhancement. Her research confirms its impact and she is exploring how successful imagery can be used in a variety of situations.

An applied model of imagery in sport has three aspects: situation, function of imagery, and outcome. Dr. Gregg applies this model to three stages athletes experience: training, competition, and rehabilitation. Also taken into consideration are the variables of age, competitive level, and athlete imagery ability that affect the relationship between imagery and performance. The data consistently confirms that as ability with imagery improves, it becomes a more useful tool to improve athletic ability and recovery. This holds true for all athletes, and not any less for high level competitors where the deciding factor between competitors may depend upon mental fortitude rather than physical prowess.

Dr. Gregg is also investigating whether imagery can enhance emotional well being. Can anxiety be reduced or

self-efficacy increased? Intervention studies test the theory. Dr. Gregg collaborates with an athlete to identify a specific goal. The athlete is provided an imagery script designed to improve confidence or to manage anxiety. Subsequent measurements of performance have clearly shown improvement. The studies have also proven imagery is a skill that can be developed and improved.

Athletes with intellectual disabilities and their use of psychological skills present fascinating possibilities. Dr. Gregg's initial

The studies have also proven imagery is a skill training can improve.

research explored the use of self-talk, goal setting, and use of imagery for Special Olympic athletes. As a result, these athletes became more focused during their skill training. As well, their performance in competitions became more consistent.

Currently, Dr. Gregg is a member of an international research committee whose mandate is to establish adequate classification criteria for athletes with intellectual disabilities. In response to

the 2000 Sydney Paralympics scandal when athletes without a disability played on the Spanish basketball team, athletes with intellectual disabilities were prohibited from future Paralympics competitions. Fortunately this decision is being reversed in time for the London 2012 games. Previously, IQ scores were the only criteria used for classification. However, low IQ does not necessarily inhibit skill performance. Physiologically, athletes with an intellectual challenge exhibit no significant differences. The committee's new classification criteria will add sport

psychology to cognitive tests and include sport specific tests and training history.

Dr. Gregg intends to apply the knowledge acquired from working with high-performing individuals with an intellectual challenge to the general population also living with these challenges. Improved performance and confidence is possible in all areas of life for everyone. ■

Big Brother is our Friend

Fulfilling the two opposing mandates is somewhat like walking a tightrope.

Working in homeland security, Dr. Atrey is caught between the conflicting goals of increasing multimedia surveillance capabilities and preserving privacy. Fulfilling the two opposing mandates is somewhat like walking a tightrope. To achieve balance, Dr. Atrey's answer is to build models and algorithms.

Dr. Atrey has analyzed traditional security methods regarding privacy. Traditional methods focus on automatically detecting and obscuring Regions of Interest (RoI) in the video – for example, a person's face. However, without 100% accurate RoI-detection methods, privacy is not attained. Furthermore, the hidden or implicit inference channels that can compromise privacy are completely ignored. These channels are location, time, and activity. Dr. Atrey has developed a technology that allows selected functions to be applied to the original video. Prior to viewing for investigative purposes, those channels compromising privacy are blocked, leaving intact the channel required for qualifying the activity as suspicious or normal. For example, obscuring or hiding the name tag on

the door will protect the identity of a person who normally accesses that room at a particular time.

As well, accuracy in surveillance control rooms is at risk. An operator usually monitors up to 16 cameras at a time. Given that a human being can effectively monitor only four camera views simultaneously, improving accuracy lies in reducing the number of screens. Dr. Atrey has developed an algorithm dubbed Dynamic Selection and Scheduling of CCTV Views. Computers are programmed to automatically process the information of the 16 cameras and to transfer views of suspicious activity to four

from 70% to an impressive 85%.

Some monitoring activities require multiple cameras in close proximity. Dr. Atrey has programmed the computers to fuse the multi-camera data and work both in competition and in cooperation. Recording a suspicious activity can involve multiple tasks. For example, in the event of a person abandoning a suspicious object in the hallway, there could be three tasks. In order of priority, they could be identification of the person, identification of the abandoned object, and tracking of that person. Initially all three cameras compete for person identification. When that task is better

Big brother isn't so scary after all.

enlarged screens. Human confirmation as to the relevance of the assigned importance to these views is essential. Computer observation of the operator's eye orientation provides this feedback. If attention is fixed elsewhere than on the selected views, the top four screens change views accordingly. Operator detection accuracy has been increased

accomplished by a particular camera, the other two compete for the second priority task. Preliminary controlled tests have proven to be extremely successful and indicate worthwhile results from field testing.

Big brother isn't so scary after all. ■



Professor: **Dr. Pradeep Atrey**
Title: Assistant Professor
Department: Applied Computer Science



Professor: **Dr. Jenny Chen**
Title: Assistant Professor
Department: Business and Administration

Three Rights Make a Success

Dr. Chen is interested in the contracts between retailers and manufacturers. In many cases, the contract or relationship connection is reduced simply to ordering, to pricing and to shipping. Through developing models, Dr. Chen illustrates how these contracts, whether rudimentary or somewhat more involved, can function on multiple levels to the benefit of all stakeholders. Dr. Chen is also interested in how contracts can coordinate the supply chain or improve the supply chain efficiency. To achieve this objective, manufacturers and retailers must consider themselves as partners rather than as entities independent of each other.

One area of her research is revenue management (RM). RM can be simply described as selling the right product to the right customer, at the right price and at the right time. Dr. Chen's

customer services as a matter of course. Take, for example, refunds or product returns that incur the costs of staffing, shipping, and probably reselling. Far from recuperating the cost, companies appear to have no consideration of customer returns in their pricing and ordering decisions to mitigate the negative impact on their profits. To take these factors into account, Dr. Chen proposes a dynamic pricing model. She examines the impact of customer returns on the performance of a supply chain with a contract, such as a buy-back policy agreement between the manufacturer and the retailer where the manufacturer agrees to buy back unsold and customer returned product. Since the retailer directly reacts to the customer and handles customer returns, it is better informed on customer returns information than the manufacturer. Dr. Chen examines when this asymmetric customer returns information should

Dr. Chen's goal is to streamline the supply chain to maximize profits and minimize expenses by utilizing dynamic pricing approaches.

goal is to streamline the supply chain to maximize profits and minimize expenses by utilizing dynamic pricing approaches that require manufacturers and retailers to work as partners.

Observing common practices in customer service in the highly competitive retail industry offers some insights into such an alliance. Dr. Chen noted that companies offer certain

be shared, how this information affects the performance of the supply chain, and how to incentivize the retailer to reveal this information truthfully.

Dr. Chen will expand her research to work with business to develop the necessary data collecting field tests. ■

Teaching and Researching in Low-Income Neighbourhoods



For Dr. Silver, research and teaching are inseparable. As a direct result of his research in poverty issues, the University of Winnipeg's Urban and Inner-City Studies program is now located in the midst of inner-city life in North End Winnipeg.

The university partnership with local organizations such as the Urban Circle Training Centre is normalizing the idea of taking university courses for

Provide creative opportunities and people will flourish.

many people who otherwise would never have contemplated such an endeavour. Single mothers realize that the way to reject a life on welfare is through education. Some of the obstacles to realizing their goal are university location, child care, and financial shortfall. Part of the solution is to bring the university and child care to their neighbourhood. Dr. Silver did just that in relocating his program to Selkirk Ave.

Much of Dr. Silver's recent research has focused on a comparative

study of four public housing projects in very low-income neighbourhoods across the country: Lord Selkirk Park in Winnipeg, Little Mountain House in Vancouver, Regent Park in Toronto, and Uniacke Square in Halifax. His findings explain why public housing has suffered a decline as a safe, reasonable place to live. He concludes that, because there is not enough low-income housing in Canada to meet the demand, public housing has become housing of last resort for people in desperate circumstances.

Concentration of poverty in particular geographic areas, and the fact that many governments have abandoned inner cities and public housing for the last 30 years, have generated a range of problems. But public housing as such is not the cause of these problems, argues Silver.

Dr. Silver's findings are included in his next book, titled *Good Places to Live: Public Housing in Four Canadian Cities*. He explains how dilapidated public housing can be turned around if residents are engaged in the decision

Professor:	Dr. Jim Silver
Title:	Professor and Director of Urban and Inner-City Studies
Department:	Politics

making and the vision for their neighborhoods, and if governments invest in creating opportunities for the people who live there. For example, local residents in North End Winnipeg's Lord Selkirk Park have recently been employed in renovating all the units in the housing project, and some will now move on to apprenticeship programs, while others are attending an adult learning centre to earn their mature Grade 12.

Providing the type of education and job opportunities people in difficult circumstances need and can have pride in is imperative to solving problems associated with poverty. This is the case in Lord Selkirk Park, and is substantiated with Dr. Silver's relocation of his Urban & Inner-City Studies program to the North End. Provide creative opportunities and people will flourish. ■

Graduate and Undergrad Students

Kaleigh Norquay, Master of Science in BioScience, Technology, and Public Policy, Graduation 2012



Kaleigh Norquay researches hibernating patterns of little brown bats. These flying mammals are under the threat of White Nose Syndrome (WNS), a fungus killing 75%-100% of hibernating bats. Norquay's objective is to determine the disease's impact and to identify traits associated with survival. Examining a number of hibernacula, she analyzes a 20 year data base to correlate the impact of weather

patterns, sex, and site location on survival patterns. WNS cave survival is determined by using PIT-tagging, a small micro-chip attached to the bat and read by a scanner located at the cave's entrance.

Conservation will continue to be central to Norquay's career. ■

Michael Lang, Honours Physics, Graduation 2011



Michael Lang has always had an interest in natural phenomenon particularly magnetism. Choosing to perform research in the realm of Magnetic Resonance Imaging (MRI) early in his career, he continues to find the basic principles of MRI astounding. His primary research focuses on Nuclear Magnetic Resonance (NMR) and MRI in both high and low-field systems. Lang plans a Master's program involving low-field NMR, a project in which he will probe, to an

unprecedented level, neutron behaviour.

Aspiring to further the knowledge of diagnostic imaging, he looks forward to completing a doctorate of Physics and continuing research and development. ■

Buddhika Prasangamwb Madduma, Master of Science in Applied Computer Science and Society, Graduation 2011



Text based search engines like Google are fertile grounds for Buddhika Madduma's research. His goal is to develop an intelligent content based image retrieval system. He uses artificial intelligence methods such as Neural Network, Fuzzy Logic, and Support Vector Machines to classify similar and non- similar images. Madduma's system would utilize

features such as colour, texture, edges, and shape from the original image to retrieve similar images. Madduma anticipates the tremendous potential of an image based retrieval system in the search engine market.

In the future, Madduma plans to continue his research in new artificial intelligence applications at the doctorate level. ■

Anne Lindsay, Master of Arts in Archival Studies - Graduation 2011



Working with archival records, Anne Lindsay became increasingly aware of the potential archives and archivists have for advancing human rights, including Indigenous rights, both nationally and internationally. Her research highlights two such cases where aboriginal rights and related treaty claims were substantiated and the Canadian government changed its position of outright rejection of Aboriginal rights.

Lindsay hopes her research will contribute to the efforts of archivists and Indigenous people to identify the opportunities for partnerships and community building. As a result of her internship through the Archival Studies program, Lindsay has been offered a position with the Truth and Reconciliation Commission of Canada. ■

Kerri Paschke, Honours Psychology, Graduation 2012



Compassionate love, the focus of Kerri Paschke's research, is central to her personal life. Surprisingly, the concept of compassionate love is not understood equally by psychology experts and lay people. The purpose of Paschke's research is to develop a prototype analysis that clearly measures compassionate love rather than love in general and to create a more comprehensive scale that can be used in future research.

Motivated by the conviction that compassion truly furthers the best atmosphere in society and improves relationships between family members, friends, and strangers, Paschke plans to apply her work to enhance the lives of children and adolescents. ■

Brittany Budzan, Honours Psychology, Graduation 2011



The attachment style adults develop is determined by the availability and quality of care received during infancy from primary caregivers. Brittany Budzan is researching how different attachment styles influence the manner in which adults engage in support seeking behaviours. Her research will help identify attachment styles that produce a low level of perceived social support. Budzan's research will contribute to the growing literature

regarding the complex system of dyadic relationships and help identify attachment styles that elevate an individual's risk of developing depression or other mental health issues.

Budzan will continue her research into attachment theory, exploring correlates such as self-esteem and relationship satisfaction. ■

Beyond Opportunity and Ability

Professor: **Dr. Michelle Owen**
Title: Associate Professor
Acting Coordinator of Disability Studies
Department: Sociology



Disability within a gender framework is the focus of Dr. Owen's research. Her current projects include a three-year study on workplace environment for university faculty members with Muscular Sclerosis within a gender framework, and a five year longitudinal study into the abuse of women with disabilities by their partners.

University faculty members identified travel to and from work and workplace discomfort as major drains on time and energy, notes Owen. Adaptations involved working at home and redesigning research goals to reduce travel abroad. However, this also created isolation and a sense of invisibility.

Dr. Owen's preliminary research into the abuse that women with disabilities endure underlined the desperate need to give people with disabilities visibility and a voice. The challenges could be a deterrent to participating. Could they hear the advertisement? Were they able to read the notice? In other cases, silence was imposed by professional care givers, educators, or in the case of minors, parents denying access to interviewees. In addition, individuals self describing

Within the social model of disability, the lack of ramps is disabling, not the fact that someone uses a wheelchair.

as female with a disability and having experienced abuse were often reticent to speak about intimate challenges.

Dr. Owen intends to fill at least some of these knowledge gaps with participatory research. Focus groups allow participants to realize that is a significant social issue and to advocate for adequate provision of physical and psychological supports. For example, abuse shelters need to be wheelchair accessible, while crisis lines need to be equipped for the deaf. General population awareness, as well as that of the population with disabilities, needs to be increased.

Under Dr. Owen's direction, the Disability Studies Program at The University of Winnipeg is being built around the social rather than the biomedical model of disability. Within the social model of disability, the lack of ramps is disabling, not the fact that someone uses a wheelchair. It is also

important that alternative teaching formats are being utilized. Core courses are available by video, on line, and by web CT. One of the courses Dr. Owen designed and teaches is delivered simultaneously on campus and via video. The technology allows spontaneous sharing between on-and off-campus students, taking integration a step further. Red River College students completing the Disabilities and Community Support program receive 45 credit hours towards the UWinnipeg Disability Studies Program.

The 2010 Council of Canadians with Disabilities recently recognized Dr. Owen's scholarship in the area of violence against women with disabilities. Dr. Owen's hope is that her research will be taken up by grassroots activists to inform governments and encourage them to enact appropriate legislation for the support and protection of people with disabilities. ■

The Climes They Are A-Changin'

A well-respected expert in climatology, Dr. Blair suffers no hesitation in stating that global warming is here to stay. However, he is adamant that "We must not give up on trying to reduce the amount of warming, all the while preparing for the inevitable."

Dr. Blair's research demonstrates that substantial changes to temperature and precipitation conditions in the Prairie Provinces have already occurred. He also studies the synoptic climatology of the region, involving an analysis of the types of atmospheric circulations observed over North America. The purpose is two-fold: to determine how pressure patterns affecting the area change from year to year, and to evaluate how longer-term climate change affects the patterns. Working with a research assistant and an Australian collaborator, Dr. Blair is developing a user-friendly computer program that "crunches" decades of synoptic data and produces high-quality graphics "better than any other program out there."

Professor: **Dr. Danny Blair**
Title: Professor
Department: Geography Department Chair

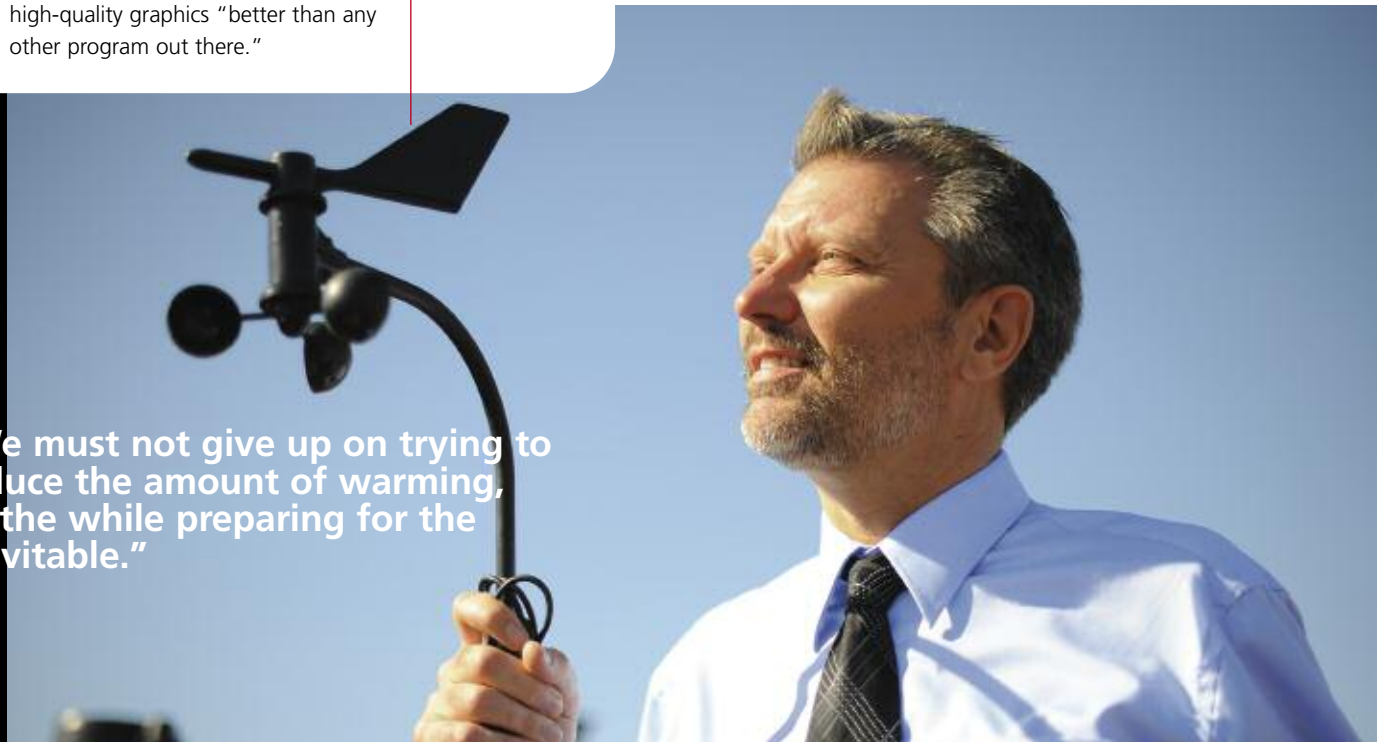
As the hydrological cycle "kicks into high gear," the Prairie Provinces will endure more flooding and, ironically, more drought. Surface water will frequently be a scarce commodity necessitating conservation and storage. Dr. Blair expends considerable energy convincing individuals, governments and industries that we need to prepare. His message is consistent, "We have to plan ahead, to minimize risks and take advantage of new opportunities."

Dr. Blair has studied how transportation in the Prairie Provinces is likely to be affected by climate change. He wrote the chapter on transportation in a 2010 book, *The New Normal: The Canadian Prairies in a Changing Climate*. His work clearly shows that winter roads in Manitoba are becoming less viable. If the Manitoba winter warming trend continues, the 2200 km winter road network will be effectively eliminated by the end of the century. Without long-term planning, this will have very serious consequences for northern and remote communities.

Dr. Blair has another line of research related to climate change and transportation. He is part of a multi-university team designing the next generation of batteries for plug-in hybrid vehicles (PHEVs) — vehicles whose electric batteries can be recharged by plugging into an outlet, thereby reducing reliance on fossil fuels. For his part of the project, Dr. Blair and his undergraduate research assistants are monitoring urban driving patterns by installing GPS units in vehicles. The goal is to determine how "big" the batteries will have to be to accommodate the demands of typical drivers, and where charging stations will have to be located.

He notes that "Our study is a great illustration of applied Geography, with high-tech geographical techniques being used to solve a real-world problem." ■

"We must not give up on trying to reduce the amount of warming, all the while preparing for the inevitable."



Healing Together

Professor: **Dr. Angela Failler**
Title: Associate Professor
Department: Sociology and Women's and Gender Studies



The 1985 Air India bombings remain a marginalized Canadian tragedy despite recent official efforts to recognize the significance of the event. The bombing continues to be imagined as something that happened to “others,” even though the majority of those killed were Canadian citizens. Why, Dr. Failler asks, has this catastrophic event not registered more substantially in

acknowledged as a national trauma. Many Canadians still think of and remember the bombings as a foreign event. Dr. Failler insists that systemic racism has influenced this perception, including a failure to recognize the victims, who were mostly Canadians of South Asian backgrounds, as Canadian

constitutes Canadian identity and citizenship, and to challenge the persistence of exclusionary ideas of “Canadianness.” Public commemorations and memorials are significant in this dialogue, for who is remembered—and how—reveals not only whose deaths are considered worthy of public mourning, but whose lives are seen as integral to conceptions of national identity. Dr. Failler believes this discourse to be of paramount importance.

It is important to heal as a nation.

Canada’s collective memory? To find answers, she examines the social dynamics that have contributed to this marginalization, and explores whether public commemorations that *do* exist constitute meaningful forms of redress. Ultimately, she is working toward an alternative framework for building “communities of memory” that would see those who were immediately affected by the bombings joined by others in an overdue national mourning. It is important to heal as a nation.

The Air India bombings, Dr. Failler argues, have not been fully

citizens. The lack of a national response, she says, is embedded in the dominant perception of whiteness as concomitant with Canadian identity.

With a recent federal inquiry, the Prime Minister’s apology, and the unveiling of public memorials, the Air India bombings may seem to have finally reached national priority. However, Dr. Failler cautions that this official recognition not be expected to serve as “closure” for a national mourning and remembrance that never was. Rather, it should serve to initiate a national dialogue on what exactly

Dr. Failler will use the findings from her research to extend the significance of remembrance practices in response to incidents of mass violence and terrorism. Dr. Failler also recognizes and emphasizes the contribution of South Asian Canadian artists towards both a “critical historical consciousness” and healing. The arts can point to creative ways for offering hope, working through the lingering effects of trauma, and bringing citizens together to mourn the losses associated with the 1985 Air India bombings. ■

Magic has its Rewards

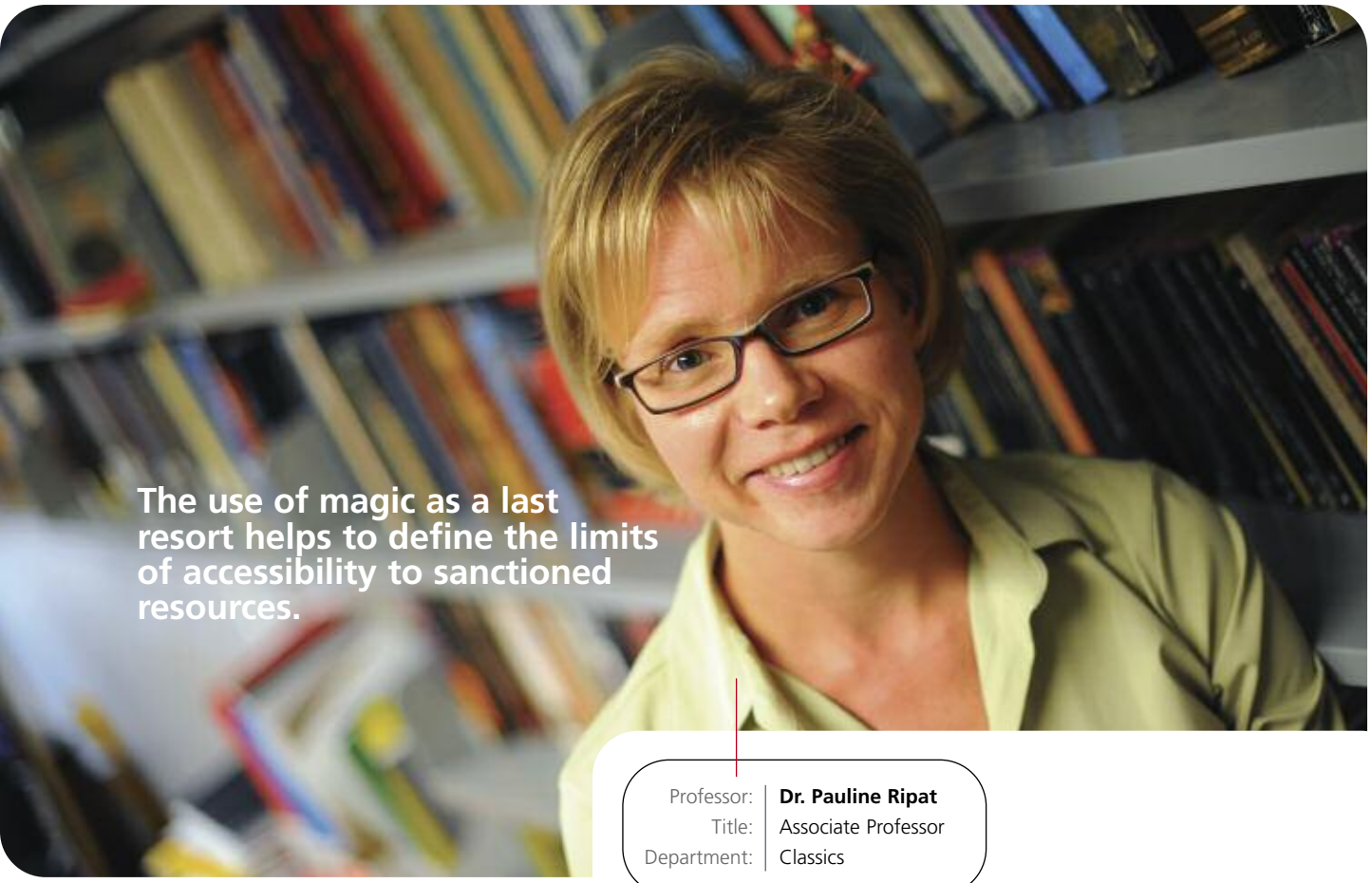
Dr. Ripat's interest lies in the dynamic movement of power in ancient Roman society through the study of magic and its purveyors, magicians and diviners. Except for those who enjoyed official sanction, these magicians and diviners were generally marginalized, perceived as being in competition with the official priesthood or as subversive to the reigning elite. Recognizing that lower status individuals have difficulty accessing accepted methods to problem solving, Dr. Ripat questions how these practitioners existed alongside the powerful. The study deepens the understanding of the expected location of power and its actual location. As Dr. Ripat states, "The study of magic is fascinating and rewards its students very well."

Since ancient Roman society possessed no pretext to equity for all

citizens, Dr. Ripat's work provides a rare impression of the non-elite's struggle to survive. How did people whom laws did little to protect attain a measure of status and power? Often there existed no other recourse but magic. The use of magic as a last resort helps to define the limits of accessibility to sanctioned resources. For example, the influence and status of a powerful man's wife would be shattered if she lost his favour. All conventional avenues of redress would be blocked.

The denigration of magicians and diviners served the powerful well; individual citizens could be discredited by being accused of practicing magic. Entire groups of people would be dismissed in an insidious manner by applying the derogatory descriptors "magic" or "superstition" to their attempts at social self-preservation. The unofficial magicians and diviners were the scapegoats during times of general societal malaise, often suffering expulsion.

A comparative examination of ancient and modern day societies in terms of the location of power and the actual practice of it affords Dr. Ripat's students an emotional distance when developing a more nuanced understanding of today's fringe groups' struggles. It is supposed that well-entrenched charters of human rights and the constitutional protection of civil liberties guarantee equalization. Is this true in practice or is this guarantee a veneer, veiling a different reality? The study of antiquity allows students an emotionally neutral position in which to establish the relevance of this question in their own lives. ■



The use of magic as a last resort helps to define the limits of accessibility to sanctioned resources.

Professor: **Dr. Pauline Ripat**
Title: Associate Professor
Department: Classics

Bridging Two Worlds

Refugees from war-torn countries face daunting challenges as they adjust to Canada and overcome the horrors of war. Dr. Stewart believes all arrive intending to be successful, but failure for traumatized youth is too often the case. The high school dropout rate of war-torn refugee students shocked Dr. Stewart. Further, if dropouts fell into street or

conceptualized in Canada, such as counseling, often leave students with a sense of futility. As Dr. Stewart states, “Kids prefer to be bad rather than look stupid.” While exemplary programs to support these children do exist, they are, at best, a piecemeal approach to solving a problem with serious personal and societal consequences. Stewart’s research also revealed that most newcomer support programs rely

develop curriculum based on a non-western perspective. She developed 42 lessons with the insights gained from interviews with educators and families victimized by war. Ugandan teachers, also desperate for effective strategies, are currently implementing the lessons in several northern Ugandan village schools with high enrollment of at-risk students. This year, how the lessons were implemented and the impact on students’ success will be assessed.

You cannot educate the mind of the child who feels threatened.

gang life, conflicts with the justice system followed within a short 12 months of leaving school. Surely effective education will help reverse this trend, believes professor Stewart.

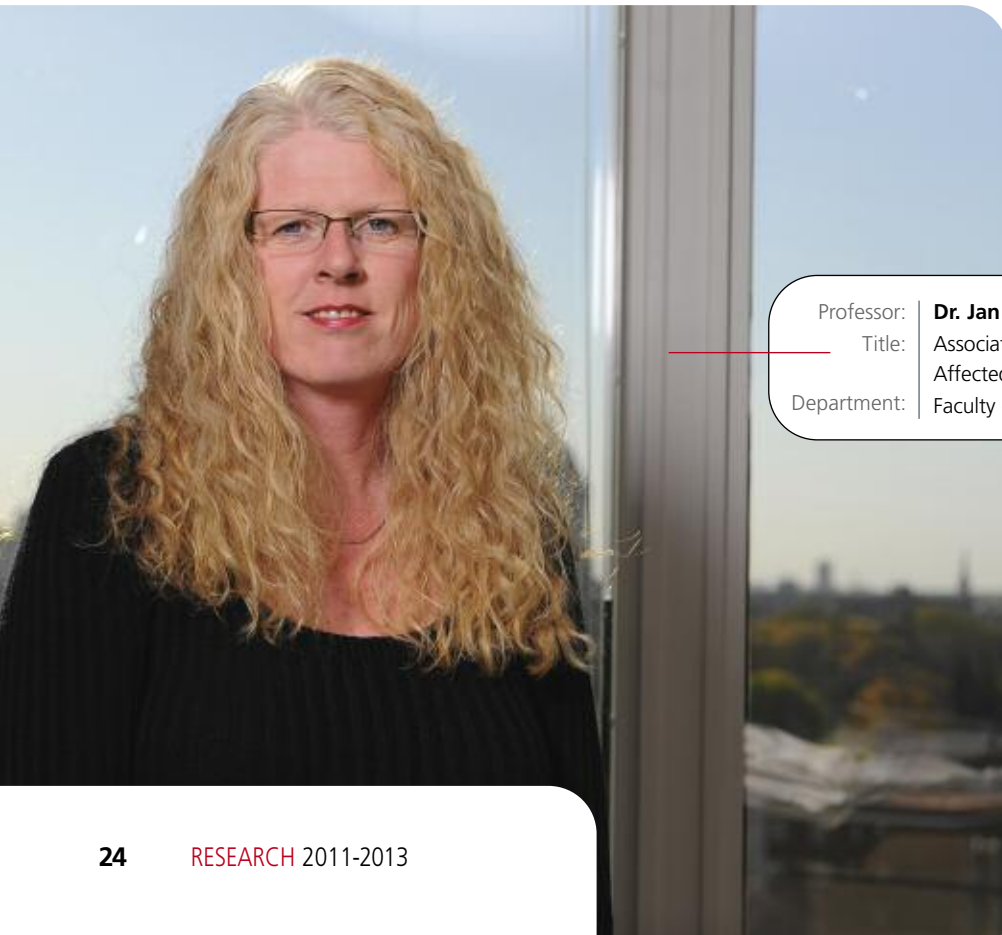
Teachers find themselves at a loss when dealing with verbal or physical outbursts, a defeatist attitude towards academic success, or social withdrawal. Solutions

exclusively on teaching intensive language and literacy skills, but there are few resources to support psychosocial development. Stewart notes, “You cannot educate the mind of the child who feels threatened and it is simply impossible to ‘teach away’ trauma.”

Dr. Stewart has travelled to Uganda to

Concurrently, the lessons are being field-tested in Manitoba. Dr. Stewart partners with the Manitoba School Improvement Program, N.E.E.D.S. Centre, Welcome Place, Training Resources for Youth, and UNICEF. Four targeted groups have been identified: new arrivals to Canada; those who have been here from one to three years; high-risk to reoffend adolescents and; students in two high schools. The knowledge gained from the Ugandan and the domestic experience will be accessible to all professionals with the publishing of her book, *“Supporting Refugee Children: Strategies for Educators.”*

Dr. Stewart has developed an undergraduate elective course and two graduate courses for the Post Baccalaureate Program. Consistent with



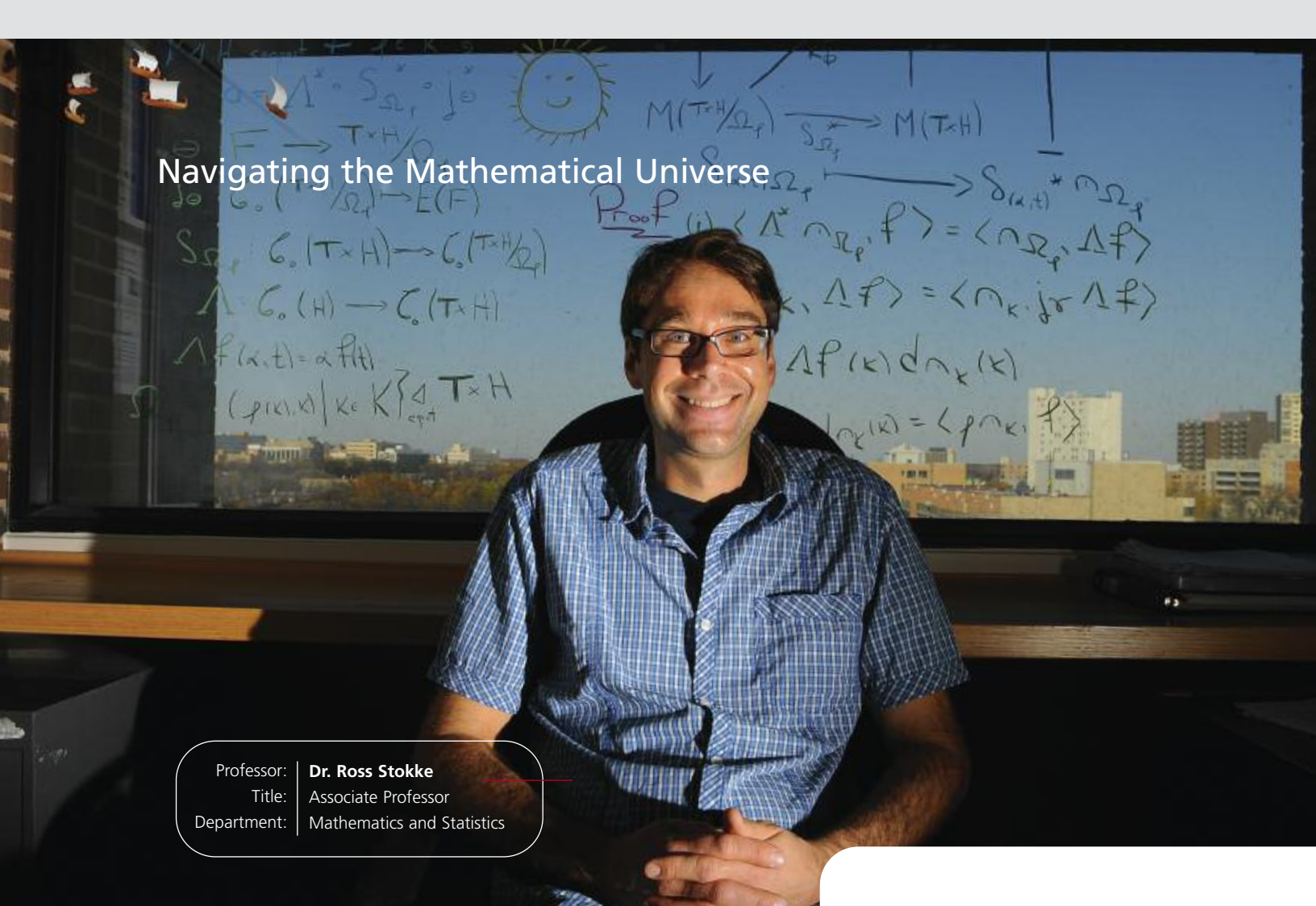
Professor: **Dr. Jan Stewart**

Title: Associate Professor, Director of the Institute for Children Affected by War, Global College

Department: Faculty of Education

a non-western perspective, the summer institute teaching team includes two Ugandan faculty members and a co-researcher from the United States. In conjunction with Manitoba Education, a two-week “Building Blocks of Hope” institute has been developed for teachers in the areas of curriculum, English as an Additional Language, intercultural capacity building, and counselling. ■

Navigating the Mathematical Universe



Professor: **Dr. Ross Stokke**
 Title: Associate Professor
 Department: Mathematics and Statistics

Dr. Stokke describes himself as a theoretical mathematician and marvels at how pure mathematics can result in very useful mathematics. His research area may be traced back to Fourier's discovery, which revolutionized both physics and mathematics: any wave function, no matter how complex, can

mathematical objects, there is a great wealth of other locally compact groups that are of fundamental importance in math and physics. Dr. Stokke's research is in Abstract Harmonic Analysis where, in opposition with the classical theory, the mathematics occurs in arbitrary locally compact groups. It has been

and possibilities. In navigating this world, play is as essential as knowledge and imagination. The quest is never-ending and therein lies its appeal.

Dr. Stokke's particular area of research involves using the tools of functional analysis to study the many Banach algebras and operator algebras that surround any locally compact group. Here is revealed a beautiful tapestry of interconnected mathematical objects. In essence, Dr Stokke's research involves studying these objects in relation to each other and, especially, in relation to the locally compact group — the sun at the centre of this mathematical solar system. The truth is rarely obvious but Dr. Stokke finds motivation in the "good, beautiful mathematics" in which he is immersed. Applications are not necessarily immediately forthcoming from theoretical mathematics, but as in the case of Riemann's non-Euclidean geometry, which provided the mathematical framework for Einstein to describe his theory of relativity, the wait is often worthwhile. ■

The truth is rarely obvious but Dr. Stokke finds motivation in the "good, beautiful mathematics" in which he is immersed.

be broken down into an infinite sum of simple sine and cosine functions. In particular, classical harmonic analysis, still a thriving area of study, was borne from Fourier's work. This area of analysis usually occurs on the real line, the integers, or the unit circle, all of which are topological and algebraic objects known as locally compact groups.

Beyond these particular

shown that these topological groups always have a Haar measure allowing for the measure of the size of sets. As such, locally compact groups provide an extremely rich mathematical environment in which the fields of mathematical analysis, algebra and topology blend in an elegant theory, a mathematical universe presenting a seemingly infinite arena of problems

Phosphorus Losses from Manure and Fertilizer Amended Soils



Professor: **Dr. Darshani Kumaragamage**
Title: Associate Professor and Director
Department: Environmental Studies

The challenge faced by farmers is to minimize the phosphorus loss occurring during spring runoff and leaching.

Dr. Kumaragamage is interested in reducing the phosphorus losses from agricultural soils. Phosphorus is an essential nutrient for healthy crops and is often supplied in the form of fertilizers and manure. The challenge faced by farmers is to minimize the phosphorus loss occurring during spring runoff and leaching. Not only does this loss leave the soil impoverished, the eventual phosphorus accumulation in natural bodies of water - most notably, Lake Winnipeg - is of growing environmental and economic concern.

Dr. Kumaragamage's initial task is to compare the quantity of phosphorus losses in fields where manure fertilizers versus synthetically produced fertilizers are applied. Unique to the prairies is the application of manure in the fall as opposed to the spring. The short (and in some years non-existent) spring does not afford sufficient time between

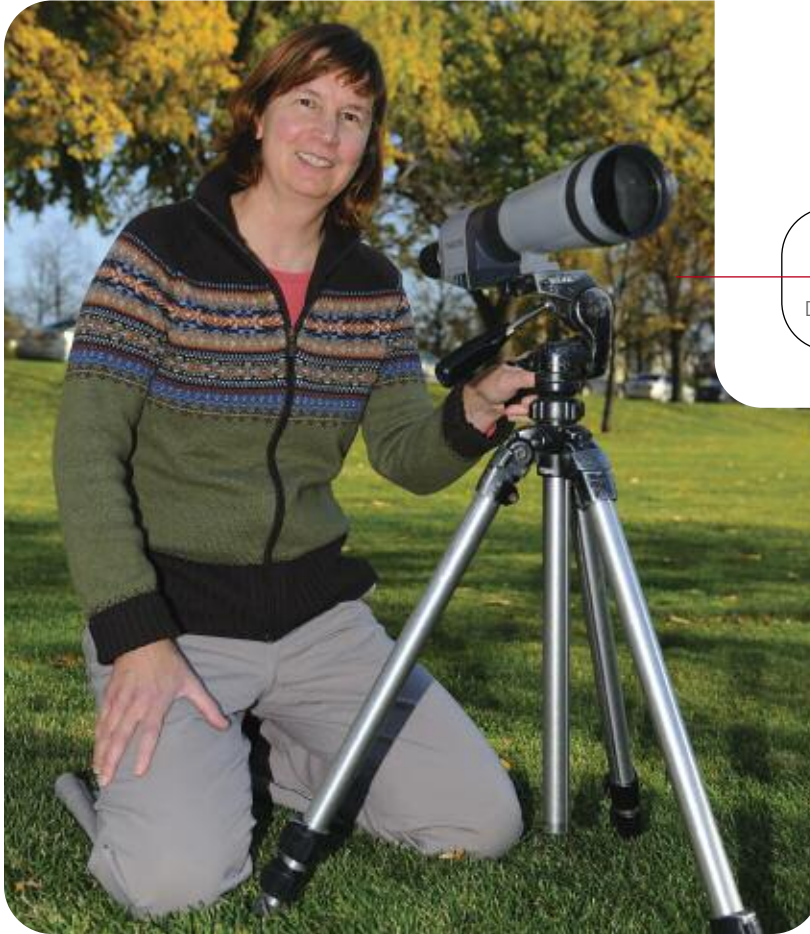
manure application and seeding. The fall application allows a longer interaction period between the manure and the soil. Although this longer period may result in the stabilization of phosphorus, it could also enhance losses by increasing the mobility of phosphorus.

Conducting comparative studies of liquid swine manure, solid cattle manure, and synthetic fertilizers, Dr. Kumaragamage has established that soils amended with synthetic fertilizer suffer the greatest losses. In the case of manure, greater losses occur when liquid swine manure is applied rather than the solid cattle manure. She intends to test the hypothesis that this is a consequence of form.

Soil type also plays a role. In a normal loamy or clay soil, greater losses occur from runoff than from leaching. This confirms the practice by some Manitoba farmers to inject the liquid swine manure and to deep band synthetic fertilizers rather than to surface apply it. In the case of solid manure, injection or deep banding is not possible but fortunately losses are low.

Given the practice of manure application in the fall, research into possible physical and chemical changes to manure-applied soil due to repeated freezing and thawing will contribute further data on manure dynamics in soils. Could these changes also accelerate phosphorus mobility by releasing mobile forms into the soil? Dr. Kumaragamage will identify chemical species from incubated soil samples that have experienced thawing and freezing after manure application. Leached samples gathered from lysimeter barrels installed in fields will provide the necessary field data. ■

Altruism on the Prairies



Professor: **Dr. Susan Lingle**
Title: Assistant Professor
Department: Biology

Dr. Lingle's research focuses on the evolution of prey defenses as it affects their biology, psychology, and ecology. A focal point in her research is animal cooperation witnessed predominantly in defense against a predatory threat.

Dr. Lingle's comparative study of two closely related species (the white-tailed deer and the mule deer) reveals astonishing differences in co-operation when reacting to the cry of a threatened fawn. Prior to taking any defensive action, the whitetail will first verify if the young is her own. The mule deer will immediately bolt to the defense of the fawn regardless if the fawn is even of her own species. The mule deer's seemingly altruistic behaviour is difficult to understand because the mule deer derives no apparent benefit from

defending a whitetail fawn. To understand the evolution of this behaviour, Dr. Lingle expanded her study to genetically intermediate subspecies and other species to discover if altruistic defense must be present to ensure defense of one's own fawn. The findings indicate this is not the

Altruism remains a long standing puzzle in evolutionary biology.

case. Altruism remains a long standing puzzle in evolutionary biology.

Prey defensive behaviour also affects vulnerability. Particular species are more vulnerable during certain seasons which in turn influences the predators' choice of prey. Mule deer are more vulnerable in winter, whitetails in the summer. However, the abundant

presence of a third prey, say, ground squirrels, will alleviate the predatory danger to whitetails in the summer and be transferred to mule deer with the arrival of winter once the ground squirrels head underground.

The study of ecology normally builds upon the relation of prey numbers to predator numbers. However, scarcity and abundance reveal only part of the answer. A more complete view of the ecological systems is required. For example, preferring to fight, mule deer choose a rugged slope. Whitetails favour flight over gentle ground. Dr. Lingle proposes it is prey behaviour that drives predator decisions. Simply put, "It's the prey that calls the shots."

Most of Dr. Lingle's work has been conducted on the prairie grasslands of western Canada. The prairies possess one of the largest proportions of at-risk plants and animals of any ecosystem in North America. Dr. Lingle

uses an understanding of prey behaviour, seasonal vulnerability, and unintentional provisioning of predators through human activities to identify the reasons that prey on the prairie are at particular risk. She collaborates with others to increase awareness of the plight of the prairie and to address the problems that currently face many prey species living on the prairie. ■

Professor: **Dr. Chris Wiebe**
Title: Associate Professor
Department: Chemistry

More is Different

As scientists attempt to respond to new market and technological demands, they realize that current knowledge of electricity and magnetism is still at a fundamental level. To respond to these demands, Dr. Wiebe, a solid-state chemist, must combine atoms from

search for a new superconductor that will operate at room temperature. The best way to study superconductors is to obtain single superconductor crystals. Recreating the phenomenon of low or no resistance at room temperature would provide a long awaited breakthrough; the significance in practical terms would be impressive. The expense of an MRI for example, would be drastically reduced, as the need to use liquid nitrogen to cool the superconductor, which is what the patient essentially lies in, would be eliminated. Manitoba Hydro could export hydroelectric power throughout the continent, as no energy would be lost due to heat-producing resistance.

The serendipity of science is in discovering new physical laws as different atoms are combined into ever more complex structures.

different materials to create new ones with new properties. However, the more complex the material, the more mysterious its properties. Delving into the mystery, Dr. Wiebe applies the known fundamentals of magnetism and electricity in complex materials.

Crystal growth is an important part of Dr. Wiebe's work. Reducing polycrystalline materials to a single crystal structure allows Dr. Wiebe to examine a pure material. In a single crystal the atoms are rigidly lined up making the discovery of its properties more accessible.

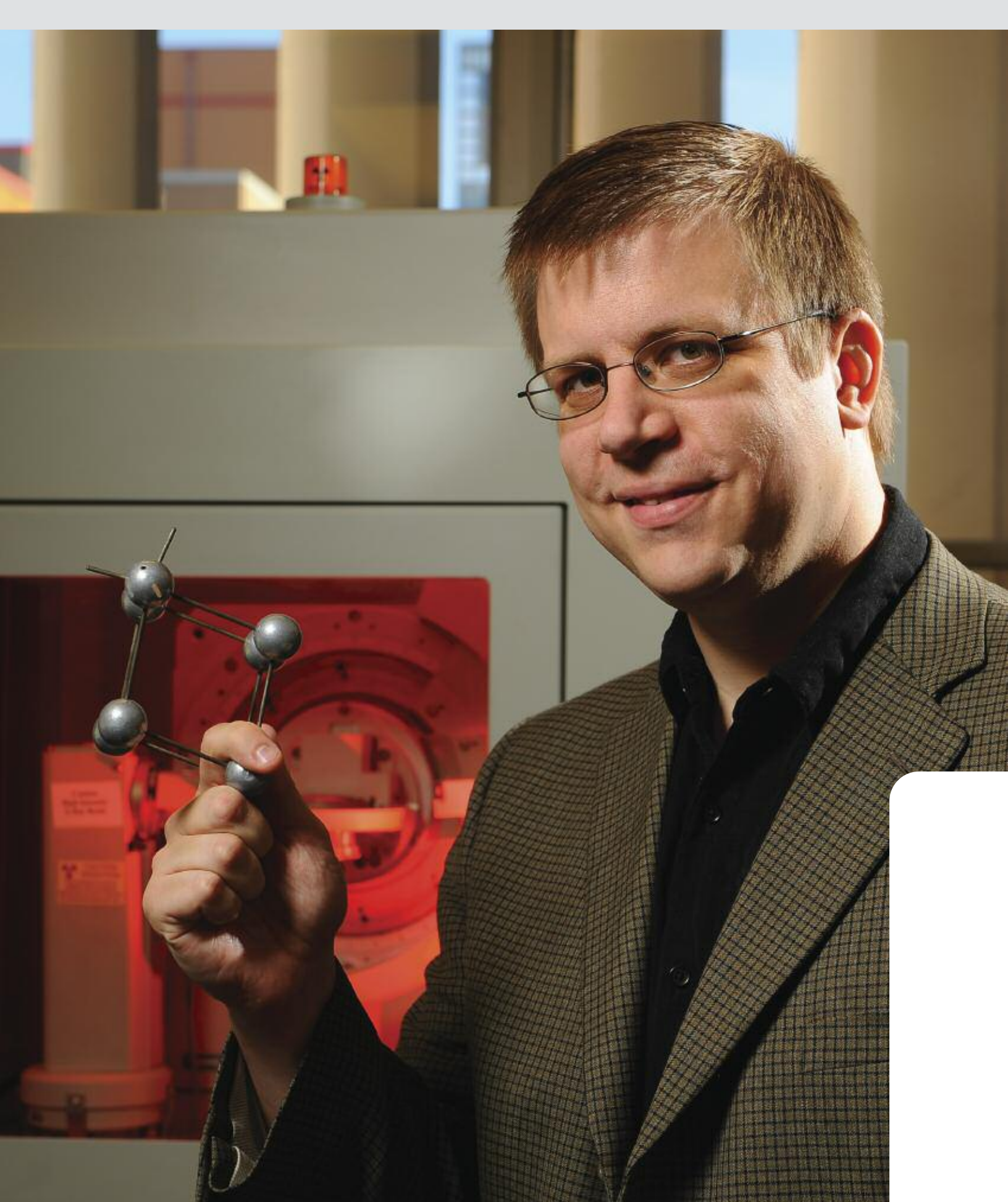
Dr. Wiebe is applying his findings to the

neutrons will interact with it, divulging the material's atomic structure and its magnetic properties.

Many electrical devices require both a magnetic and an electrical field. However, materials tend to be ferromagnetic, or ferroelectric, or both. Solid state chemistry creates multi-ferroic materials possessing both properties. Engineers can use the electrical field to generate a magnetic field or conversely, use the magnetic field to generate an electrical field. As Dr. Wiebe puts it, "The challenge is not in developing new circuits; it is in developing new material that can operate inside the circuits."

Recently, The Canadian Foundation for Innovation awarded Dr. Wiebe a \$1 million grant to create a solid state laboratory, the Prairie Research Institute for Materials and Energy at The University of Winnipeg. It is Dr. Wiebe's strong desire to have the Institute contribute to Canada's long tradition of solid-state chemistry advances. The serendipity of science is in discovering new physical laws as different atoms are combined into ever more complex structures. ■

Dr. Wiebe also applies neutron scattering techniques to newly created materials. Neutrons behave like magnets. If the new material is magnetic,





Professor: **Dr. Evelyn Peters**
 Title: Professor and Canada Research Chair
 Department: Geography

Grassroots Leaders and Power

Urban geography proposes that successful cities are composed of a wide variety of groups, each contributing its culture and creativity.

Unfortunately, Aboriginal culture is often not valued as part of this mix. In collaboration with professors in Native Studies at the University of Saskatchewan and leaders of urban Aboriginal organizations, Dr. Peters embarked on a study of urban Aboriginal identity. Aboriginal people migrating to the city are often viewed primarily through the lenses of marginalization and dysfunction. The dominant society's prevailing view seemed to be that Aboriginal identity had little place in

Being Aboriginal cannot be reduced to one simple notion.

successful adaptation to urban life. To be successful, the perception was that Aboriginals have to assimilate.

Documenting the history of Saskatoon's urban Aboriginal organizations constituted one aspect of Dr. Peters study. Originally these organizations could only offer limited services, as

funding regulations forced referrals to mainstream organizations. In essence they were expected to act as a mere conduit to assimilation. However, a vibrant core of Aboriginal volunteers realized that a strong Aboriginal identity was essential to urban success. Aboriginal organizations recognized the differences between various Aboriginal cultures and incorporated these differences into their programs, demonstrating an obstinacy to the federal government's belief that urban Aboriginal identities were homogeneous.

Despite a marked lack of funding, Aboriginal organizations' strong resilience in the face of mainstream expectations resulted in innovations in activities and services.

Consequently, the mainstream organizations' ideas of what was appropriate for Aboriginal services expanded. These early successes formed the framework for expansion into job training, education, and language preservation. A space was created for the emergence of an Aboriginal community.

Dr. Peters is also studying the way in which Aboriginal people define their own urban identities. Aboriginal individuals identify first with a particular Aboriginal group, be it Salteaux, Cree, or Métis Nation. This identification will contribute to dispelling the idea that urban life and Aboriginal identity are in mutual conflict, an idea that has created major challenges for Aboriginals.

Documenting urban Aboriginal cultures will also help mainstream society to view the Aboriginal community through the lens of culture, rather than that of poverty.

Dr. Peters is excited to study how the various ethnic and Aboriginal communities who face similar challenges view their own space in Winnipeg's inner city, and whether alliances can be forged to promote understanding and support. ■

Men, Women, and Intimacy

Most people would agree with the statement that marriage and family are our primary relationships. But when asked, “What brings joy, happiness, and meaning to your life?” friendship is inevitably at or near the top of the list. Research tracking a person’s day indicates that many of the most joyful moments are with friends. In fact, the enjoyment with friends is greater than that experienced with a spouse alone (enjoyment is greatest when in the presence of friends and spouse). Dr. Fehr is convinced that friendships are not sufficiently recognized as key relationships in psychology literature, despite documentation that a network of friends contributes to emotional wellbeing, physical health, and even longevity.

Dr. Fehr states we derive these benefits because friendships are an important source of intimacy. Interestingly, there exists a strong gender difference in how women and men conduct friendships. Men tend to engage in activities with friends. Women’s friendships revolve around talking, mostly about personal and relationship issues, with a focus on their feelings and emotions with respect to those issues.

Given these gender differences in friendship, Dr. Fehr questions whether intimacy in friendship holds different meanings for men and women. Surprisingly, her research has shown that the answer is *no*! In fact, men and women agree that intimacy is created when friends feel they can open up to each other about their fears, joys, and hopes. Men and women are also in agreement that engaging in activities with friends is less conducive to intimacy.

Why then are men not sharing their emotions with their same sex friends? Quite simply, they don’t want to. Although men know how to create intimacy, their preference is to express their most personal thoughts and feelings in a romantic relationship.

Dr. Fehr tested if men would be more satisfied with their same sex friendships if they engaged in personal self-disclosure. She conducted a comparative study of pairs of male

friends placed in a situation conducive to sharing personal information and pairs who discussed only neutral subjects. The men who mutually shared more intimate information reported increased intimacy and greater satisfaction with the friendship. Dr. Fehr is currently replicating this research using videotape to capture the dynamics of “opening up” in male friendships. Specifically, she will examine whether personal self-disclosure is uncomfortable for men although positive benefits are reaped when men do “open up”, when or whether the exercise is actually pleasant for men given that a situation is structured to encourage greater intimacy. ■

Professor: **Dr. Beverley Fehr**
Title: Professor
Department: Psychology





Professor: **Marilou McPhedran,
LL.M., LL.D. (h.c.)**
Title: Principal
Department: Global College

Local Progress Via Global Teamwork

Principal since 2008, Marilou McPhedran brings to the Global College her legal expertise in human rights in Canada and developing countries. She also works as policy advisor and researcher, on projects such as the 10 country impact study, funded by the Ford Foundation, and on a major UN human rights treaty “The Convention on the Elimination of All Discrimination Against Women” (CEDAW). The first such impact study to be completed provided insights into the real impact of CEDAW on the ground level. It also spawned greater interest in the methodology of gathering sound data for comparative studies that co-ordinate the involvement of grass-roots organizations, UN officials, academic researchers, and funding agencies.

The overriding theme of the Global College is to work at the nexus between poverty and human rights.

Principal McPhedran works steadfastly to strengthen this collaborative approach. The overriding theme of the Global College is to work at the nexus between poverty and human rights. Informed by the findings of the UN Commission on Legal Empowerment of the Poor (of which President Axworthy was the only Canadian member) that disadvantaged people need to be clearly identified and documented so they can benefit from legal systems, the Global College organizes symposia for high-level researchers. Principal McPhedran directs the College’s efforts towards accomplishing the mandate on its banner: *Research, Dialogue, Action*.

By attracting external funding, McPhedran seeks to establish a seamless environment between research, teaching, and action. The Global College has just been funded by CIDA to offer five paid international internships for new Canadian graduates for the next three years. The Global College partnered with the University of Manitoba’s Mauro Centre to launch the Master of Arts Degree in Peace and Conflict Studies, a program in which students will benefit from participation in applied research. A new collaboration with the Canadian Museum for Human Rights, Folklorama, and local Rotary clubs will pilot an undergraduate Summer Institute on Global Citizenship in 2011. The Global College students create spaces for dialogue within a human rights framework, via their EYE (Effective Youth Engagement) Series which included the Summit on Poverty and Human Rights for high school students. New funding for the Global College Applied Research Online Learning Network on Poverty and Human Rights (LEPnet.org) brings together researchers, practitioners, donors and policymakers – four constituencies crucial to meaningful progress. LEPnet concentrates on disseminating applied research to ground-level organizations. Further, LEPnet’s “knowledge facilitator” directly contacts grassroots organizations about requests for grant applications, recently published papers, and possibilities for effective partnering. The vision is to incorporate this technology into a practicum for UWinnipeg students directly linked with developing world community leaders to provide research and other supports. ■

Identity, Learning, and Mathematics

Professional development programs tend to be top-down in nature, despite increasing evidence that these programs are based on incomplete models of teachers' professional learning.

Believing that learning is situated, contextual and best triggered by collaborative social activity, Dr. Betts examines the professional learning of teachers by engaging in action-oriented, on-site partnerships. This research approach is based upon a sharing of expertise, resisting any pressure toward a one-directional, expert to non-expert, transfer of information.

Dr. Betts has found that the professional learning of teachers is more nuanced than suggested by large-scale research programs because their learning is intimately entangled with identity relationships. For example, large-scale research suggests novice teachers are enculturated into the pedagogical norms of a school, whereas Dr. Betts has found that novice teachers do not automatically take up the practices of the school despite an outward appearance of conformity. In one case study, Dr. Betts illustrated how a teacher positioned herself as an effective, yet struggling novice teacher, in relation to, but distinct from, the legitimate teaching practices of her mentor. On a case-by-case basis Dr. Betts' research brings to light the multi-nuanced processes of teacher learning.

This collaborative action-oriented research agenda leads to questions concerning teachers' learning trajectories. Is ongoing change consistent with the recommendations for reforming mathematics education? Can collaborative and contextual models, which tend to be small-scale, trigger large-scale sustainable change? Top-down models tend to be insensitive to the dynamic complexity of professional learning because learning is context specific. This leads to recommendations for professional development that focus on the dispositions of educators that could enhance the practices of teachers.

Dr. Betts also explores the role of identity in student learning. The common view of mathematics is that it is a standard body of rigid rules and

The ultimate goal is the empowerment of learners through collaborative, contextual, social activity.

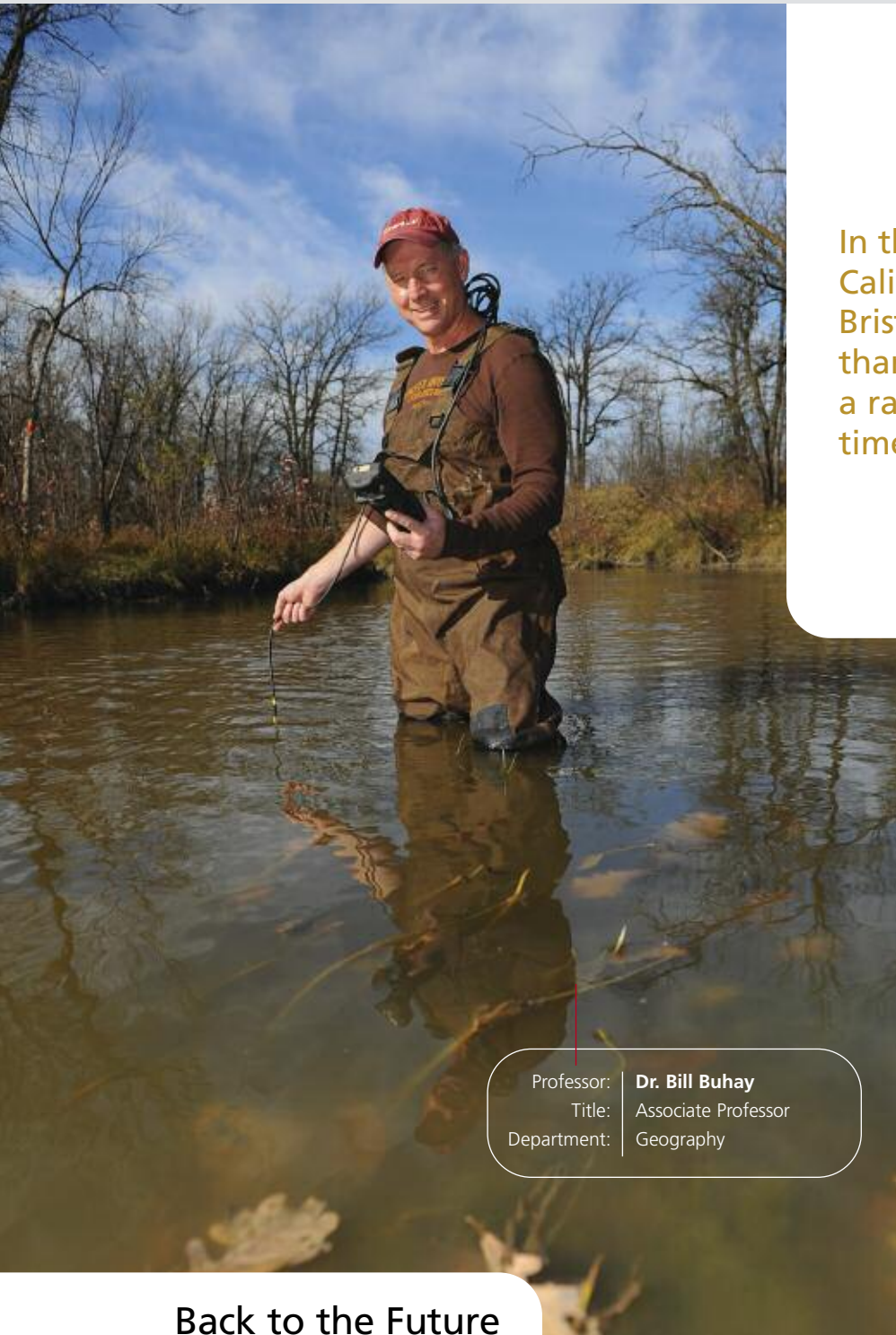
exact black and white solutions, says Betts. This view tends to reinforce teaching that silences the identity and voice of learners. Dr. Betts presents problems with rich potential in terms of processes and products to learners from grade school to university level. He legitimizes learners' reasoning whether or not their thinking conforms to current mathematical canons. Liberated in their thinking, students at all levels of ability have discovered

various approaches to unravel some of the complexities of mathematics. Dr. Betts believes that the legitimization of learners' thinking empowers them to more deeply engage with the nature of mathematics, including its canons, ambiguities, and mysteries.

Whether working with teachers or children, the ultimate goal is the empowerment of learners through collaborative, contextual, social activity. ■



Professor:	Dr. Paul Betts
Title:	Associate Professor
Department:	Education



Professor: **Dr. Bill Buhay**
Title: Associate Professor
Department: Geography

In the White Mountains of California, some of the living Bristlecone Pines are more than 5000 years old providing a rare absolute record of that time.

and absolute records of that time. Analyzing the stable carbon and oxygen isotopes in the tree rings, Dr. Buhay is able to date the beginning of the event at 4130 years ago.

Manitoba. Dr. Buhay is applying his knowledge to the over-nutrication of Lake Winnipeg caused by phosphorous and nitrogen in effluent emissions. These emissions can transform a healthy oxic environment into a hypoxic or anoxic one by disrupting the normal biological respiration, causing release of methane and nitrous oxide. Methane is 23 times and nitrous oxide is 300 times more disruptive than carbon dioxide as a greenhouse gas. To help stem the lake's degeneration, Dr. Buhay is monitoring the sewage point sources into Dead Horse Creek, a tributary to the Red River. Recommendations will follow once the gravity and expected extent of the problem are determined.

Looking forward, Dr. Buhay is part of a team of researchers from the Universities of Winnipeg and Manitoba considering artificial wetlands as a viable solution to mitigate the impact. This could be ground breaking, as artificial wetlands have rarely been attempted in cold climate regions. The team also foresees that the system may mitigate the negative impact of micropollutants such as pesticides and pharmaceuticals, as well as that of the nutrients. Dr. Buhay will begin to assess the efficacy of a series of ten unique microcosms this year.

Dr. Buhay is also working on a 1000 year drought record of the Red River Basin. Studying the oxygen and carbon isotopes in the rings of sub-fossil oaks imbedded into the river banks and cross-dating them with those of living trees, he has traced significant drying events back to 1400A.D. ■

Back to the Future

Dr. Buhay, a stable isotope geochemist concerned with environmental and climatic problems, does research that spans the globe and stretches from Antiquity to present day.

Cuba. Dr. Buhay collaborates with researchers from the Universities of Winnipeg, Toronto, Lakehead, and Havana. Their intent is to discover all that a pre-agricultural human site in Cuba has to reveal. Dr. Buhay has reconstructed the population's basic dietary sources of protein by examining the stable isotopic composition,

specifically carbon and nitrogen, found in the organic portion of bone remains.

The Middle East via California. More than 4000 years ago, a catastrophic climatic event precipitated a major cultural and societal upheaval in the Middle East and produced global climatic anomalies. Researchers from the University of Arizona, from Yale, and from Swansea, Wales are interested in the exact dates of the event's duration. In the White Mountains of California, Bristlecone Pines more than 5000 years old provide one of the rare

Indoor Air Quality: Is Your Child's Respiratory Health at Risk?

Dr. Polyzoi has been a member of a research team examining the relationship between housing conditions, respiratory health, and school absenteeism. The study is a collaborative effort involving three universities (Winnipeg, Manitoba, and Harvard), and combining expertise from three disciplines: health, engineering, and education.

In Canada, approximately 2-million people are affected with asthma, 10-15% of them children; asthma is the leading cause of school absenteeism among inner-city school children. Dr. Polyzoi's goal is to examine the link between respiratory health, school absenteeism, and the presence of air-borne mould in Winnipeg homes.

The study encompassed two parts. First, a survey was sent to more than 13,700 parents of nine-year-old children, the age at which asthma peaks. The survey focused on children's respiratory-related illnesses and home-based triggers for these ailments. Second, the University of Manitoba engineering faculty conducted an extensive home audit of a random sample of 715 homes.

Some remarkable findings came

to light. More than 60 percent of homes in Winnipeg have air borne mould of various genera. Mould is linked to persistent (four or more per year) upper respiratory infections and to aggravated asthma. Fifty percent of the children with upper respiratory colds and asthma lost five school days during the previous academic year and an astonishing 20% lost as much as an entire month of instruction.

It was found that central and northwestern areas in Winnipeg are more susceptible than others. Why are these sectors of the city reporting higher than usual incidences of asthma and related respiratory ailments? Dr. Polyzoi and her research team are tackling this question head on.

Homeowners need more information on how to remedy housing conditions

In Manitoba, the number of physician visits due to asthma is reaching epidemic proportions.

that invite mould growth. Parents need education on asthma triggers and effective management of their child's condition. There may also be a need for changes in the national building standards as they relate to the proper design of the building envelope. It is interesting to note Winnipeg's indoor air quality by-laws apply to commercial buildings only.

The next phase in the study will involve linking the housing conditions and school absenteeism data bases developed in Dr. Polyzoi's study, to the Manitoba Health Care data bases (e.g., Manitoba Physician Claims, Manitoba Prescription, and Hospital Discharge Abstracts) in order to gauge the severity of children's respiratory ailments. This analysis will be completed in conjunction with the Centre for Health Policy at the University of Manitoba. ■

Professor: **Dr. Louesa Polyzoi**
Title: Professor
Department: Education



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